SONY

DIGITAL AUDIO DISK RECORDER

DADR-5000

SYNC BOARD
DABK-F5001

AD/DA CONVERTER BOARD
DABK-F5002

MAINTENANCE MANUAL
1st Edition

⚠警告

このマニュアルは，サービス専用です。
お客様が，このマニュアルに記載された設置や保守，点検，修理などを行うと感電や火災，人身事故につながることがあります。
危険をさけるため，サービストレーニングを受けた技術者のみご使用ください。

⚠WARNING

This manual is intended for qualified service personnel only.
To reduce the risk of electric shock, fire or injury, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.

⚠WARNUNG

Die Anleitung ist nur für qualifiziertes Fachpersonal bestimmt.
Alle Wartungsarbeiten dürfen nur von qualifiziertem Fachpersonal ausgeführt werden. Um die Gefahr eines elektrischen Schlages, Feuergefahr und Verletzungen zu vermeiden, sind bei Wartungsarbeiten strikt die Angaben in der Anleitung zu befolgen. Andere als die angegeben Wartungsarbeiten dürfen nur von Personen ausgeführt werden, die eine spezielle Befähigung dazu besitzen.

⚠AVERTISSEMENT

Ce manual est destiné uniquement aux personnes compétentes en charge de l’entretien. Afin de réduire les risques de décharge électrique, d’incendie ou de blessure n’effectuer que les réparations indiquées dans le mode d’emploi à moins d’être qualifié pour en effectuer d’autres. Pour toute réparation faire appel à une personne compétente uniquement.

DADR-5000	Serial No. 10001 and Higher
DABK-F5001	Serial No. 10001 and Higher
DABK-F5002	Serial No. 10001 and Higher

Table of Contents

Manual Structure

Purpose of this manual 2
Contents 2
Related manuals 2

1. Service Overview

1-1. Installation 1-1
1-1-1. Operational Environment 1-1
1-1-2. Power Supply 1-1
1-1-3. Installation Space 1-2
1-1-4. Connectors and Cables for Connection 1-3
1-1-5. Jumper Settings and LED Functions 1-4
1-1-6. The installation of DSBK-F5001/F5002 1-7
1-2. Location of the Boards 1-7
1-3. Removal of Cabinets 1-8
1-4. Replacement of Main Parts 1-9
1-4-1. Replacement of Power Supply 1-9
1-4-2. Replacement of DC Fans 1-11
1-4-3. Replacement of HD Drive 1-12
1-4-4. Replacement of Mother Board 1-12
1-4-5. Replacement of Lithium Battery 1-14
1-4-6. Note of Token-ring board replacement 1-14
1-4-7. Note of SCSI board replacement 1-14

2. Spare Parts

2-1. Notes on Repair Parts 2-1
2-2. Exploded Views and Parts List 2-2
2-3. Electrical Parts List for Boards 2-10
2-4. Supplied Accessories 2-10

3. Block Diagrams and Frame Wiring

3.1. Block Diagrams 3-1
3-2. Frame Wiring 3-14

Manual Structure

Purpose of this manual

This manual is the maintenance manual of DIGITAL AUDIO DISK RECORDER DADR-5000, SYNC BOARD DABK-F5001 and AD/DA CONVERTER BOARD DABK-F5002.
This manual is intended for use by trained system and service engineers, and is provided information that is premised the replacement of circuit boards for this unit and the optional boards.

Contents

This manual is organized the following sections.

Section 1 Service Overview

This section describes installation, location of the boards, removal of cabinets and replacement of main parts.

Section 2 Spare Parts

This section describes the spare parts.

Section 3 Block Diagrams

This section describes the overall block diagrams and circuit description.

Related manuals

The following manuals are prepared for DADR-5000, DABK-F5001 and DABK-F5002.

・Operation manual(Supplied with DADR-5000)
This manual is necessary for the use and operation of this unit.

・Installation manual for DABK-F5001/F5002(Supplied with DABK-F5001 and DABK-F5002)
This manual describes the method of installation for DABK-F5001/F5002.

Section 1
Service Overview

1-1. Installation

1-1-1. Operational Environment

Operating temperature:	10 ˚C to 35 ˚C
Storage temperature:	−20 ˚C to 60 ˚C
Operating humidity:	20 % to 90 %
Mass:	17 kg

Locations to avoid

- Areas where the unit will be exposed to direct sunlight or any other strong lights.
- Dusty areas or areas where it is subject to vibration.
- Areas with strong electric or magnetic fields.
- Areas near heat sources.
- Areas where is subjected to electricity noise.
- Areas where is subjected to static electricity noise.

Ventilation

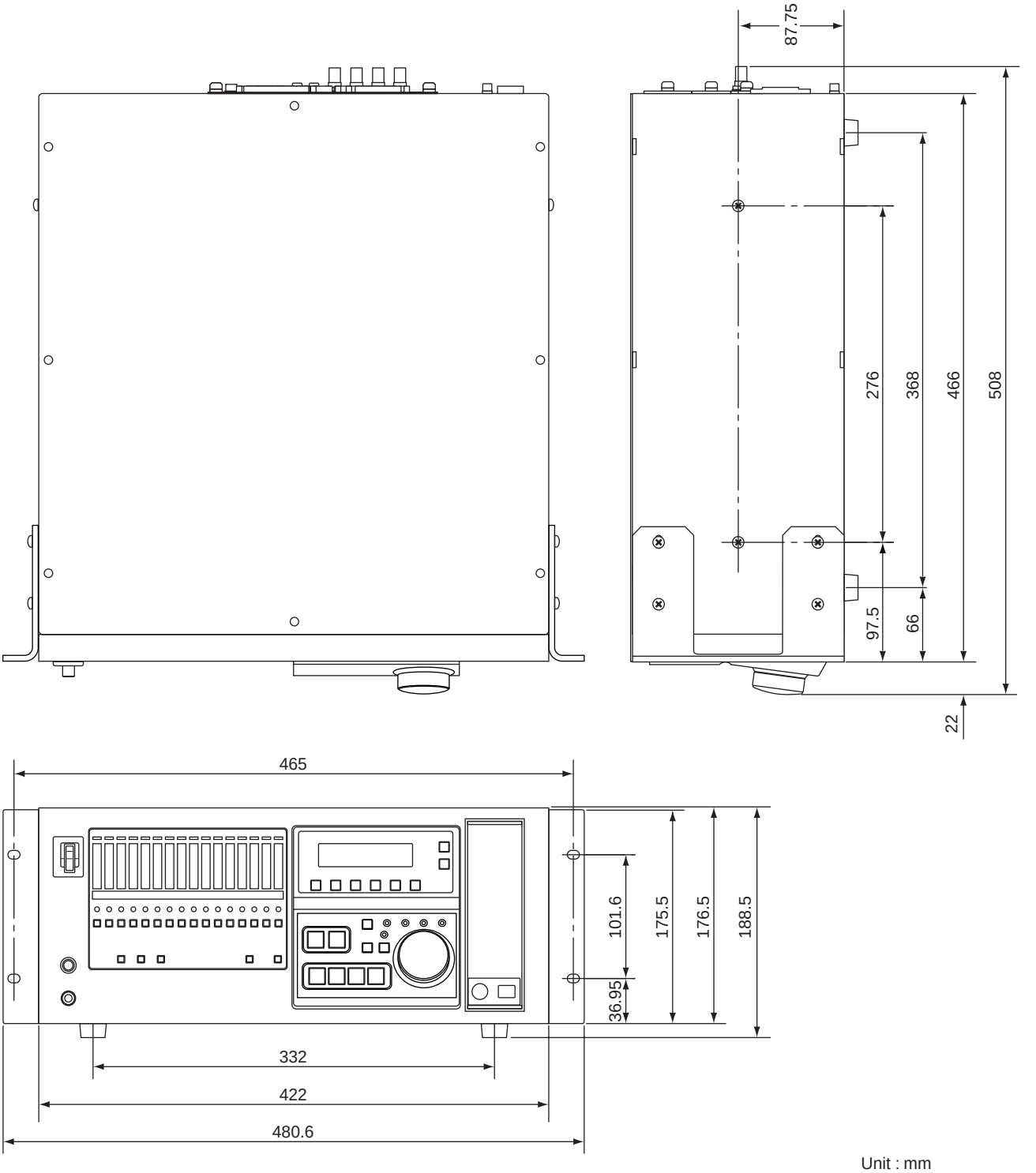
- The inside of the DADR-5000 is cooled by air circulation by three fans.
  The fan (rear panel) for power supply unit is exhaust vent.The power supply can be damaged if the exhaust vent (rear panel) is blocked or the fan is stopped.
  Therefore, leave a blank space of more than 10 cm at the rear panel side.

1-1-2. Power Supply

As DADR-5000 uses a switching regulator power supply, it can be operated without changing the power supply setting.

Power supply voltage:	AC 100 V to 120 V/220 V to 240 V
Power supply frequency:	50/60 Hz
Current consumption:	4.2 A

1-1-3. Installation Space



Unit : mm

1-1-4. Connectors and Cables for Connection

Use the connector and the cable below or the equivalent at the tip when cables are connected to each connector on the connector panel, during connection and service.

DADR-5000

Connector on DADR-5000 side		Adaptive connector/cable	
Panel display	**Name**	**Name**	**Sony Part No.**
GPI	Dsub, 37p, FEMALE	Dsub, 37p, MALE	1-958-882-11*1
GPO	Dsub, 25p, MALE	Dsub, 25p, FEMALE	1-778-862-11*1
DO(AES)	Dsub, 25p, MALE	Dsub, 25p, FEMALE	1-778-862-21*1
DI(AES)	Dsub, 25p, FEMALE	Dsub, 25p, MALE	1-778-863-11*1
SYNC(DI/DO)	Dsub, 9p, FEMALE	Dsub, 9p, MALE	1-958-883-11*1
MONITOR	Dsub, 15p, FEMALE	Dsub, 15p, MAIL RGB monitor cable	– –
MOUSE	MiniDIN, 6p	mouse cable	–
KEYBOARD	MiniDIN, 6p	Keyboard cable	–
SCSI	Dsub, Half pitch, 50p	Half pitch, 50p, MAIL SCSI cable	– –
STP	Dsub, 9p, FEMALE	Dsub, 9p, MALE	1-958-883-11*1
UTP	Modular, 8p	Cable Assy	1-958-851-11*1

*1 Supplied with DADR-5000

DABK-F5001 (SYNC Board)

Connector on DABK-F5001 side		Adaptive connector/cabl	
Panel Display	**Name**	**Name**	**Sony Part No.**
BI-PHASE	Round, 6p, FEMALE	Round, 6p, MALE	1-793-340-11*2
REMOTE	Dsub, 9p, FEMALE	Dsub, 9p, MALE	1-958-883-11*2

*2 Supplied with DABK-F5001

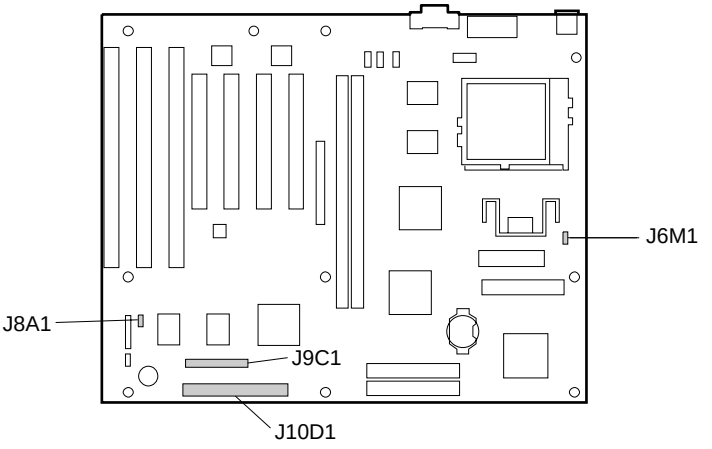
DABK-F5002 (AD/DA CONVERTER Board)

Connector on DABK-F5002 side		Adaptive connector/cable	
Panel Display	**Name**	**Name**	**Sony Part No.**
ANALOG INPUTS	Dsub, 50p, FEMALE	Dsub, 50p, MALE	1-793-342-11 (Connector)*3 3-202-677-01 (Shell)*3
ANALOG OUTPUTS	Dsub, 50p, MALE	Dsub, 50p, FEMALE	1-793-341-11 (Connector)*3 3-202-677-01 (Shell)*3

*3 Supplied with DABK-F5002

1-1-5. Jumper Settings and LED Functions

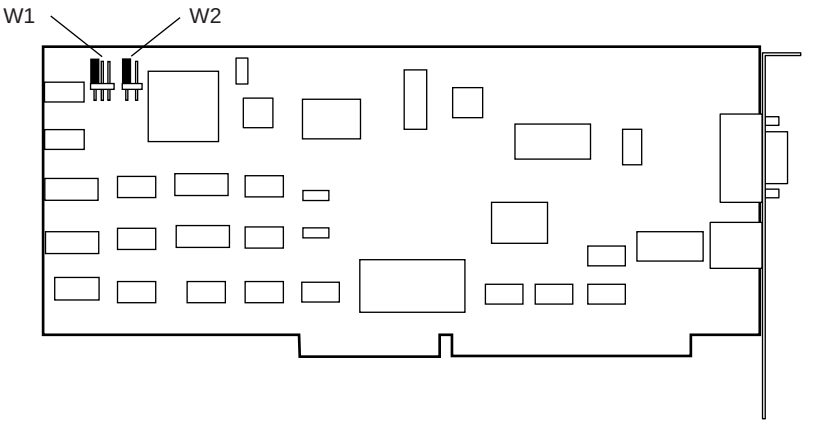
Mother board (AN430TX)

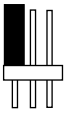
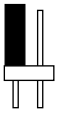


Jumper	Factory setting	Contents of setting
J6M1	J6M1 1 ○ 2 ● 3 ● pin2-3 : SHORT	Processor Voltage : VRE voltage
J8A1	J8A1 1 ● 2 ● 3 ○ pin1-2 : SHORT	BIOS recovery : Normal
J9C1-A	J9C1-A 4 5 6 ● ● ○ ● ● ○ 1 2 3 pin1-2 : SHORT pin4-5 : SHORT	Password : Password enabled CMOS Clear : Keep
J9C1-B	J9C1-B 4 5 6 ○ ○ ○ ● ● ○ 1 2 3 pin1-2 : SHORT	BIOS Setup Access : Access enabled
J9C1-C	J9C1-C 4 5 6 ○ ● ● ○ ○ ○ 1 2 3 pin5-6 : SHORT	Bus Freq : 66MHz
J9C1-D	J9C1-D 4 5 6 ○ ● ● ○ ● ● 1 2 3 pin2-3 : SHORT pin5-6 : SHORT	Processor Freq. Ratio : 2.5
J10D1	J10D1 Speaker ● ○ 27 pin26-27 : SHORT	Speaker option

SHORT:Jumper socket insertion, OPEN:Jumper socket un-insertion

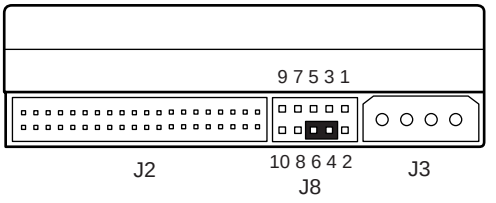
Token-Ring Network Board (SMC)

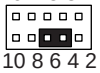


Jumper	Factory setting	Contents of setting
W1	W1  pin1-2 : SHORT	Configuration Parameter : SOFT
W2	W2  pin1-2 : SHORT	Boot ROM Option : NONE/SOFT

SHORT:Jumper socket insertion, OPEN:Jumper socket un-insertion

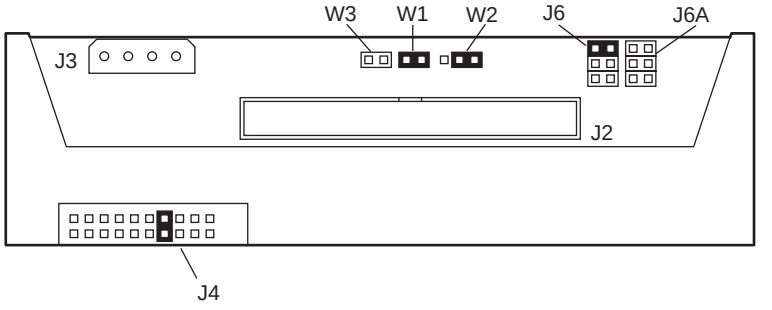
EIDE Hard Disk Drive



Jumper	Factory setting	Contents of setting
J8	9 7 5 3 1  10 8 6 4 2 pin6-4 : SHORT	Single drive setting.

SHORT:Jumper socket insertion, OPEN:Jumper socket un-insertion

SCSI Receiver (Kingston Technology)



Jumper	Factory setting	Contents of setting
J6	J6 (1 2 / 5 6) pin1-2 : SHORT	Spin Down/Up Timer : Enable
J6A	J6A (1 2 / 5 6) OPEN	
J4	(19 1 / 20 2) pin7-8 : SHORT	ID Select Pins : Reserved
W1	(2 1) pin1-2 : SHORT	Termination Power To/From SCSI BUS : Enable
W2	(3 2 1) pin1-2 : SHORT	On-Board Termination : Enable
W3	(2 1) OPEN	Reserved

SHORT:Jumper socket insertion, OPEN:Jumper socket un-insertion

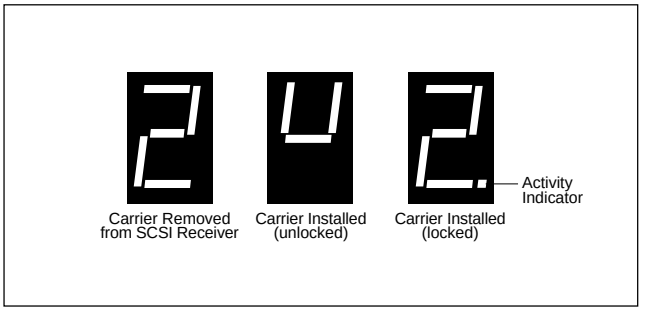
LED Functions of SCSI Receiver

Unit Number Indicator

The Unit Number Indicator displays the physical address of the SCSI Receiver device carrier if the carrier is Installed and Locked in the receiving frame or if the carrier is Removed from the receiving frame.
If the carrier is Installed but Not Locked in the SCSI Receiver, a 'u' will be displayed to indicate an unlocked condition.
The unit number is selected by means of the unit select switch inside the receiving frame using a special alignment tool supplied with the SCSI Receiver.

Activity Indicator

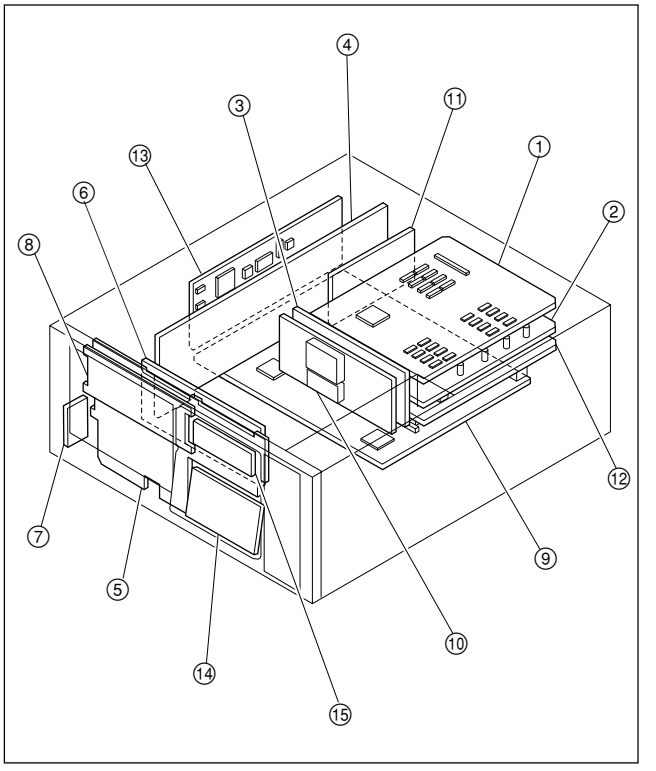
The Activity Indicator is a small dot next to the Unit Number which illuminates to show when the host computer is accessing the data on the SCSI Receiver carrier. Depending on the type of interface, this dot will either flash or glow steadily during communication with the host computer.



1-1-6. The installation of DABK-F5001/F5002

Refer to DABK-F5001/DABK-F5002 INSTALLATION MANUAL for the installation.

1-2. Location of the Boards



① AES Board
② AD/DA Converter Board (DABK-F5002)
③ Back Plane Board
④ DSP Board
⑤ Front Panel Board
⑥ Front Panel Controller Board
⑦ Headphone Board
⑧ Meter Board
⑨ Mother Board
⑩ Power Supply Converter Board
⑪ SCSI Board
⑫ SYNC Board (DABK-F5001)
⑬ Token Ring Board
⑭ Transport Board
⑮ VFD Display Board

1-3. Removal of Cabinets

Note

Before performing, turn the power off in the unit.

Top Cover

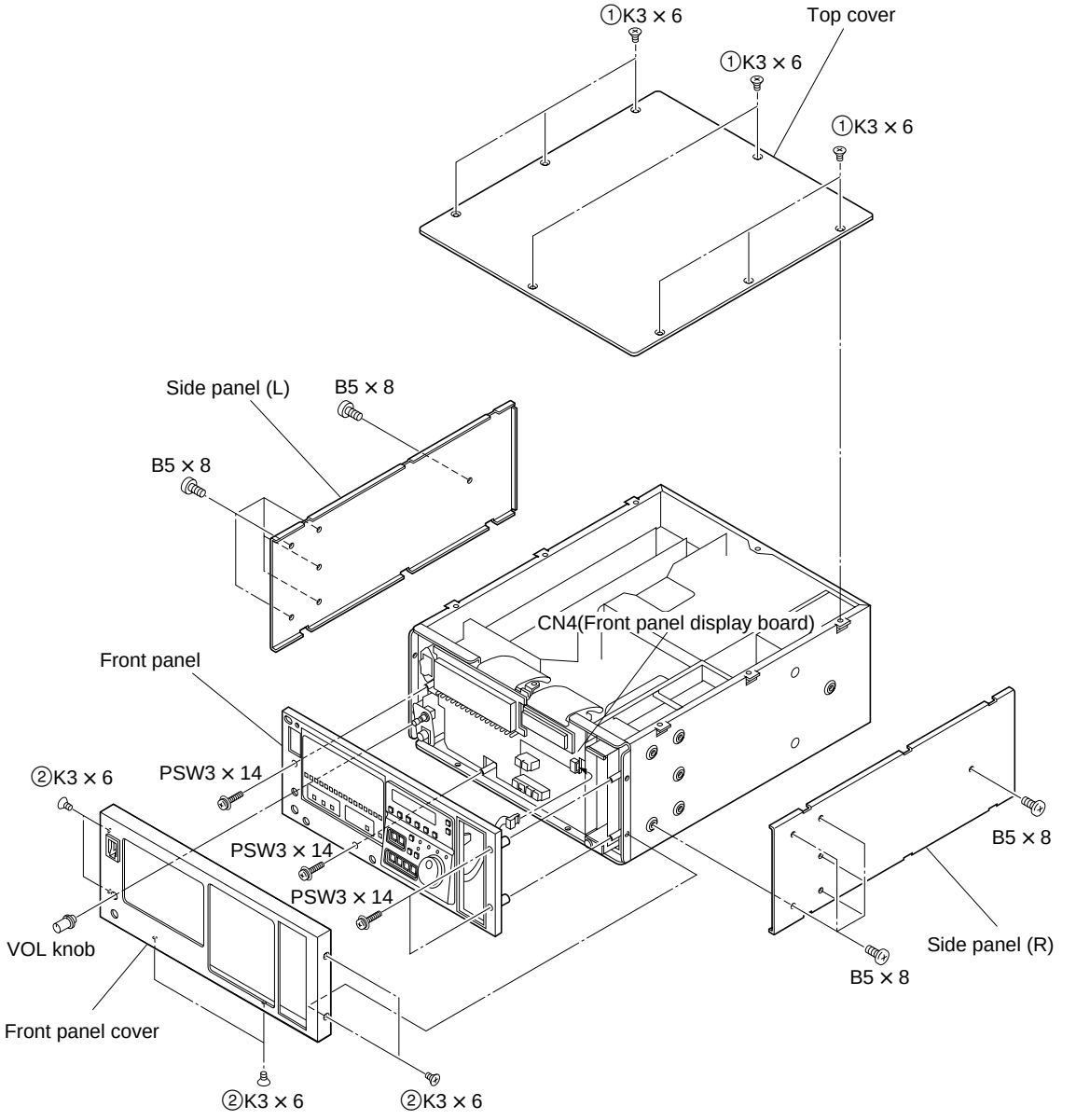
• Remove the eight screws ①(K3 × 6), and then remove the top cover.

Front Panel

(1) Pull out the knob from the VOL shaft.
(2) Remove the six screws ②(K3 × 6), and then remove the front panel cover.
(3) Remove the four screws (PSW3 × 14) and one connector, and then remove the front panel.

Side Panel

• Remove the six screws (B5 × 8), and then remove the side panel. (The right and the left are the same.)



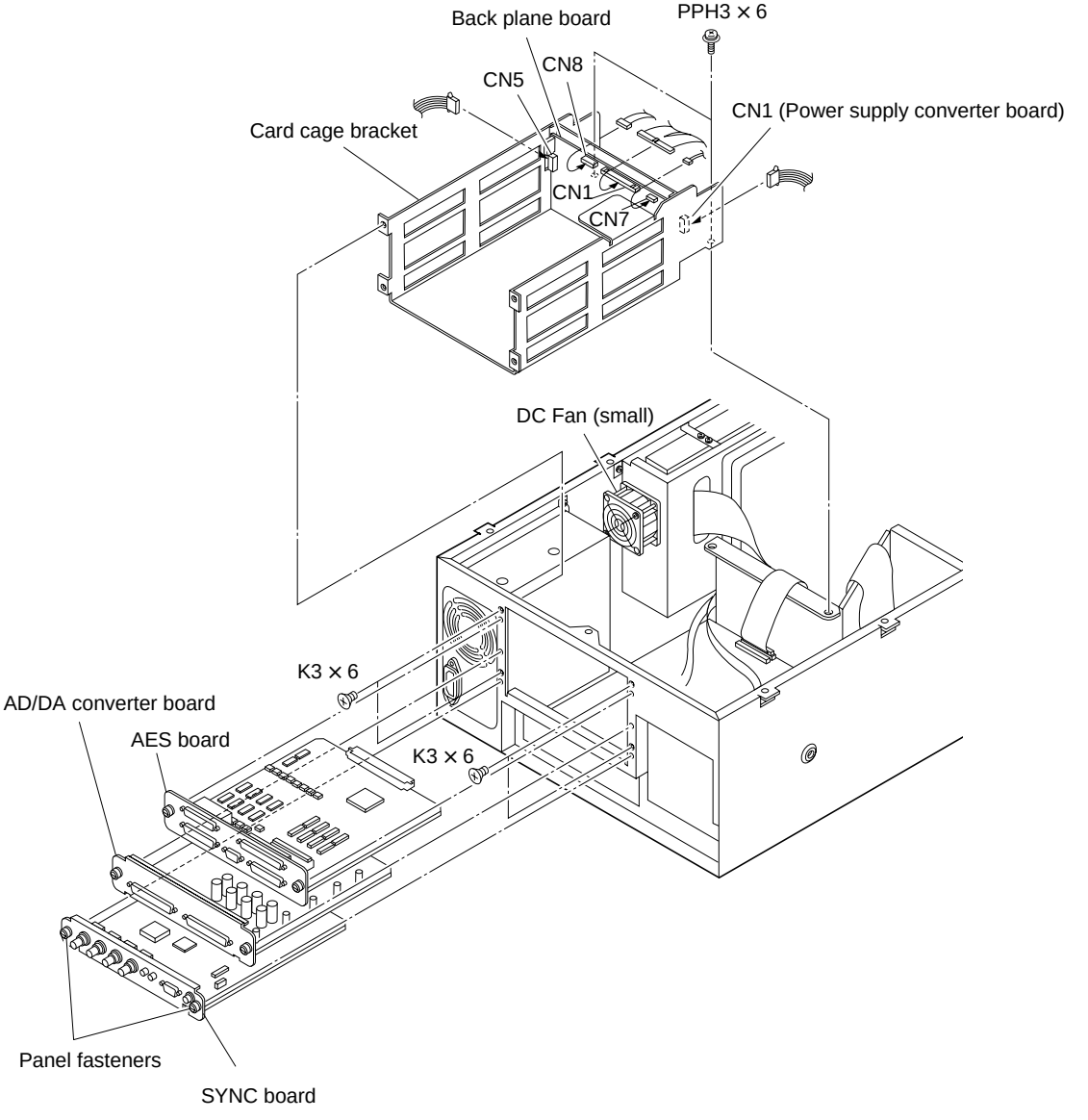
1-4. Replacement of Main Parts

1-4-1. Replacement of Power Supply

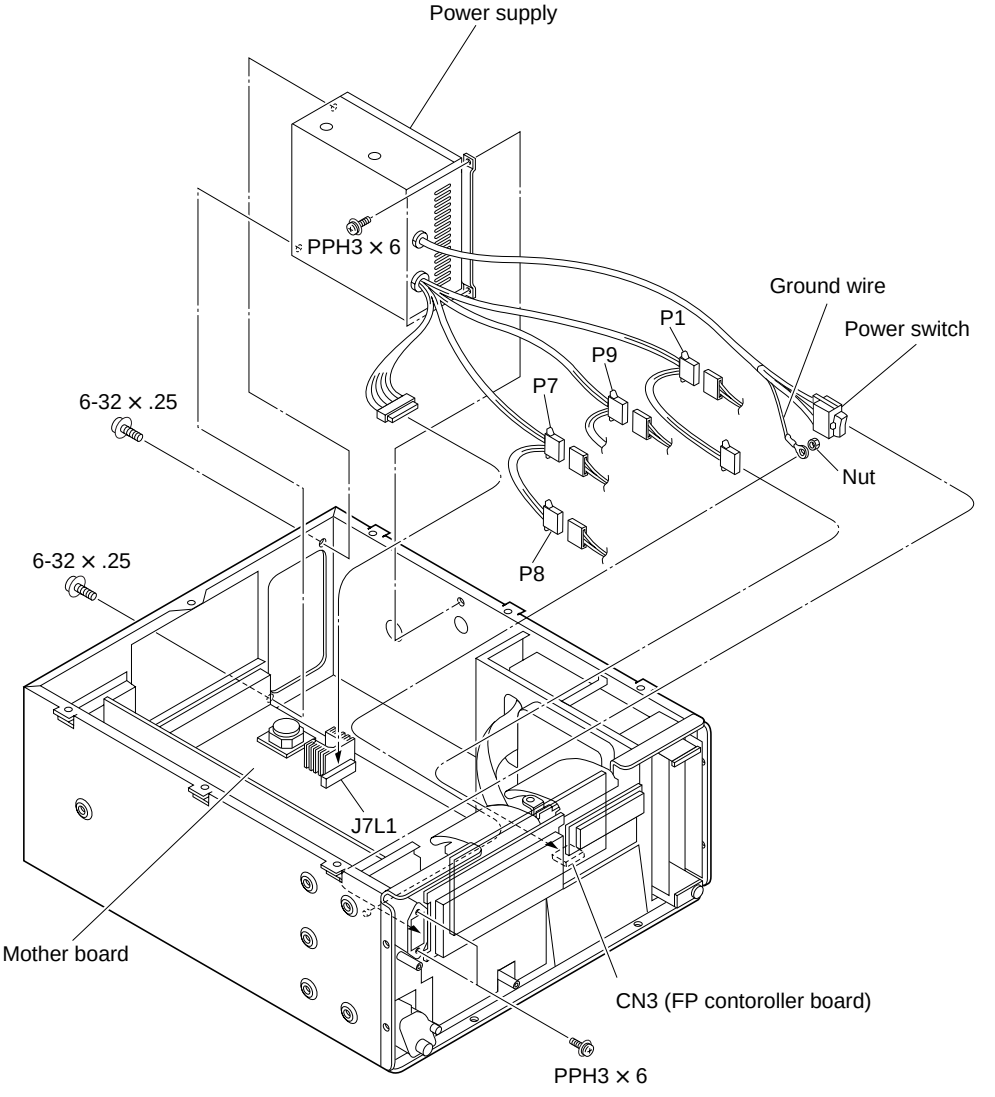
Note

Before performing, turn the power off in the unit.

(1) Remove the top cover and the front panel. (Refer to Section 1-3. Removal of Cabinets)
(2) Loosen the panel fasteners, and then remove the installed boards (AES board, AD/DA converter board and SYNC board).
(3) Remove the harness from the connectors (CN1, CN7 and CN8) on the back plane board.
(4) Remove the harness from the connector (CN1) on the power supply converter board.
(5) Remove the six screws (K3 × 6), and then remove the card cage bracket.
(6) Remove the harness from the connector (CN5) on the back plane board.



(7) Remove the harness from the connector (J7L1) on the mother board.
(8) Remove the harness from the connector (CN3) on the FP controller board.
(9) Remove the harness from the four relay connectors [P4: for IDE-HDD and CPU fan, P7: for DC fan (small), P8: for SCSI-HDD and P9: for DC fan (large)].
(10) Remove the two screws (PPH3 × 6), and then remove the power switch.
Remove the nut, and then remove the ground wire from the body.
(11) Remove the tow screws (6-32 × .25) and the one screw(PPH3 × 6), and then remove the power supply.



(12) Install a new power supply in the reverse order of steps (1) to (11).

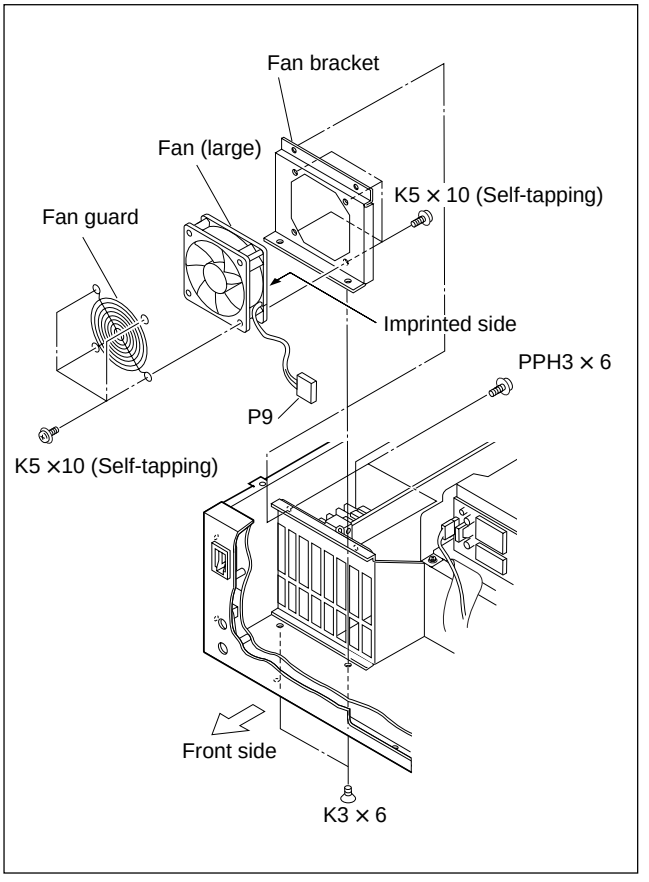
1-4-2. Replacement of DC Fans

Note

Before performing, turn the power off in the unit.

1. Replacement of DC Fan (large)

(1) Remove the top cover. (Refer to Section 1-3. Removal of Cabinets)
(2) Remove the fan harness from the relay connector (P9) of the power supply.
(3) Remove the two screws (PPH3 × 6) and the two screws (K3 × 6), and then remove the fan with the fan bracket.
(4) Remove the eight screws (K5 × 10), and then remove the fan bracket and the fan guard from the fan.



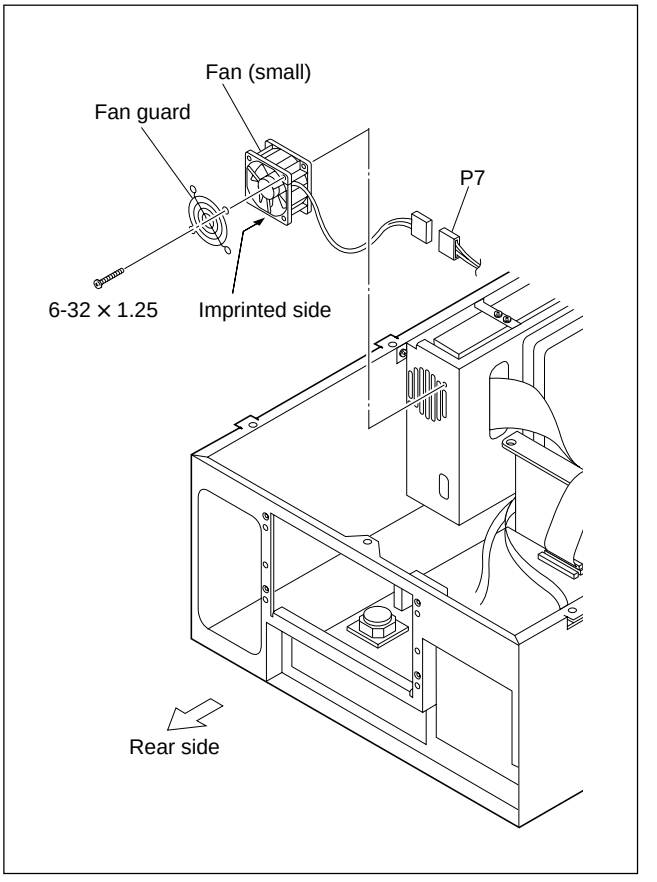
(5) Install a new fan in the reverse order of steps (1) to (4).

Note

Install the DC fan (large) in the direction shown on the figure. (The imprinted side is toward rear and its harness is extracted from the right downward.)

2. Replacement of DC Fan (small)

(1) Remove the Top Cover. (Refer to Section 1-3. Removal of Cabinets)
(2) Remove the power supply. (Refer to Section 1-4-1. Replacement of Power Supply)
(3) Remove the fan harness from the relay connector (P7) of the power supply.
(4) Remove the two screws (6-32 × 1.25), and then remove the fan and the fan guard.



(5) Install a new fan in the reverse order of steps (1) to (4).

Note

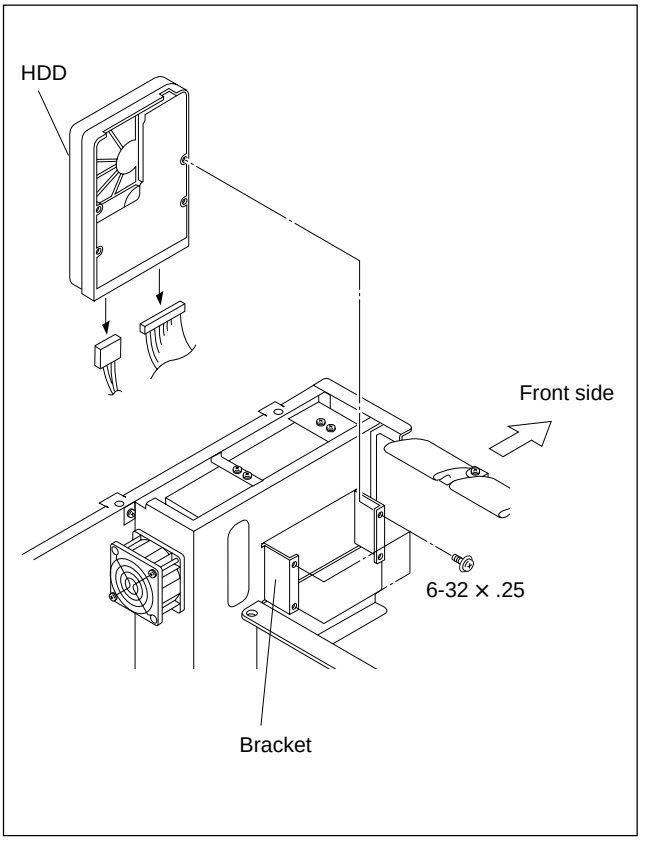
Install the DC fan (small) in the direction shown on the figure. (The imprinted side is toward front and its harness is extracted from the right downward.)

1-4-3. Replacement of HD Drive

Note

Before performing, turn the power off in the unit.

(1) Remove the top cover. (Refer to Section 1-3. Removal of Cabinets)
(2) Remove the four screws (6-32 × .25), and then pull out the HD drive from the bracket.
(3) Remove the harness from the connectors (two pieces) of the HD drive.



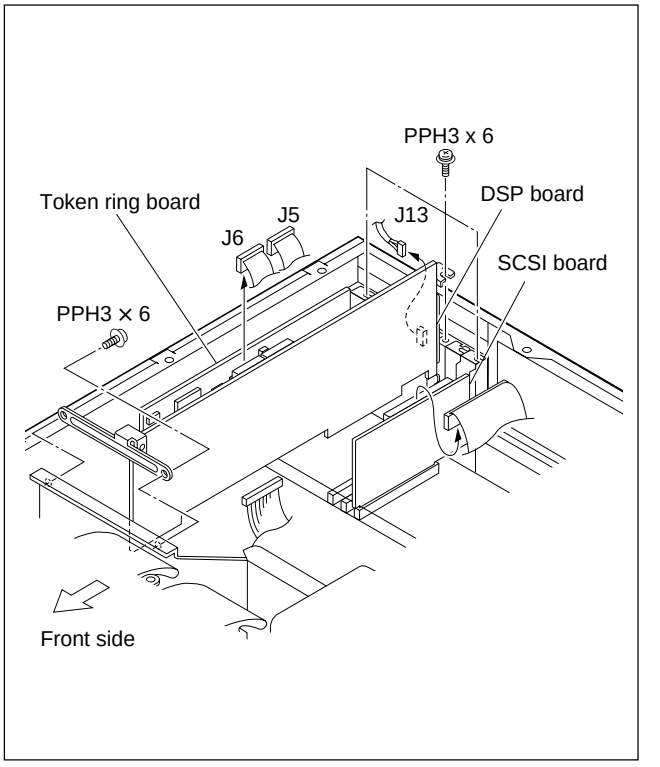
(4) Check the jumper wire J8 of the new HD drive (the system program written for the DADR-5000) with the factory setting. (Refer to 1-1-5. Jumper Settings and LED Functions.)
(5) Install a new HD drive to the bracket in the reverse order of steps (1) to (3), after the work of step (4).

1-4-4. Replacement of Mother Board

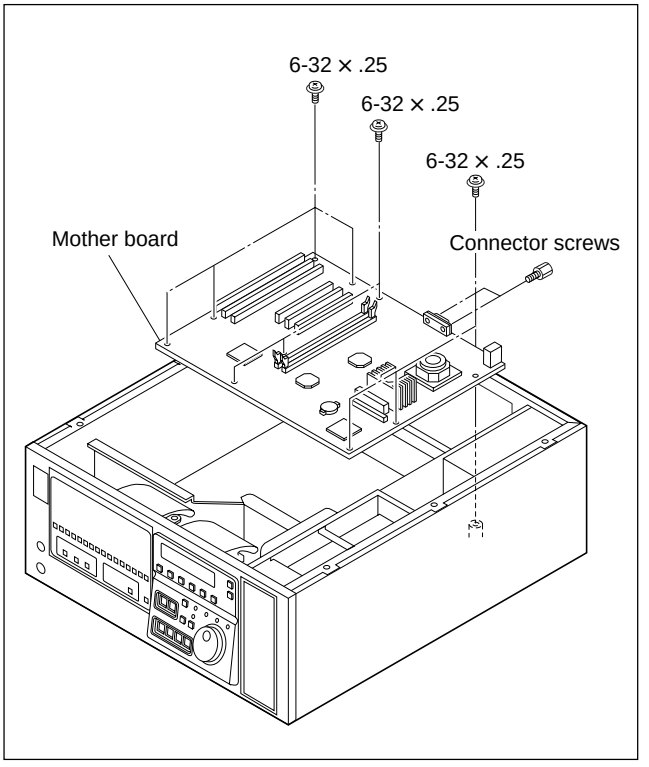
Note

Before performing, turn the power off in the unit.

(1) Remove the top cover. (Refer to Section 1-3. Removal of Cabinets)
(2) Remove the AES board, the AD/DA Converter board and the SYNC board. (Refer to Section 1-4-1. Replacement of Power Supply)
(3) Remove the card cage bracket. (Refer to Section 1-4-1. Replacement of Power Supply)
(4) Remove the harness from the connectors (J7L1: for the power supply, J10H1: PRI IDE, J1K1: COM1 and J1J2: COM2) on the mother board.
(5) Remove the harness from the connector in the CPU Fan.
(6) Remove the SCSI board, the token ring board and DSP board from the mother board.



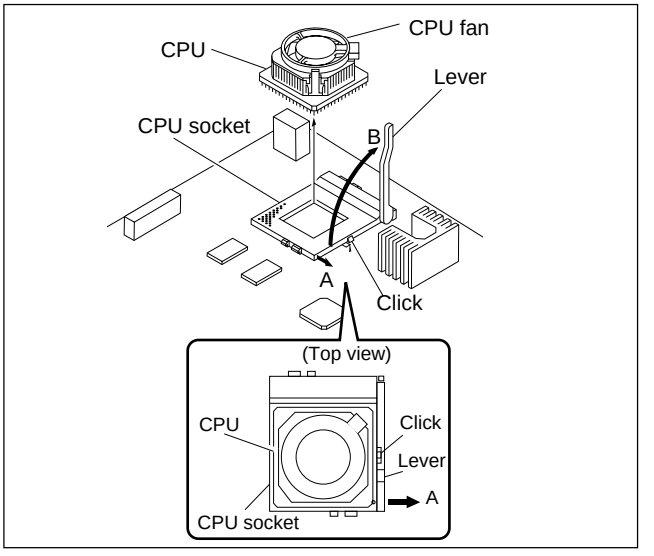
(7) Remove the twelve screws (6-32 × .25), and then remove the mother board.



(8) Perform the followings for the new Mother board.
(a) CPU/CPU fan installation.
(b) DIMM module installation.
The CPU/CPU fan and DIMM module are installed new ones or used ones removed from the preceding replacement.

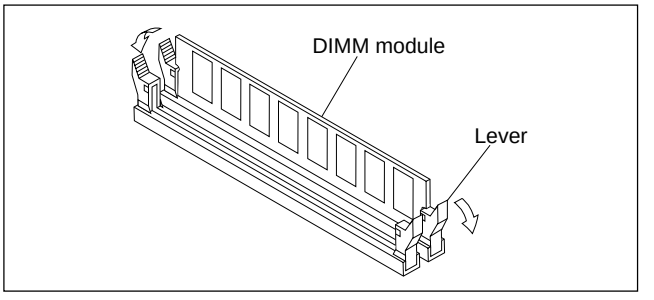
Removal of CPU/CPU fan

① Move the lever in the direction shown by the arrow A, and then remove it from the click of the CPU socket.
② Lift the lever in the direction shown by the arrow B, and then unfasten the CPU lock.
③ Remove the CPU from the socket.



Removal of DIMM Module

① Move the lever in the direction shown by the arrow, and then unfasten DIMM module lock.
② Remove the DIMM module from the DIMM slot.



(c) Jumper settings
Check each jumper wire of the new Mother board with the factory setting. (Refer to 1-1-5. Jumper Settings and LED Functions.)

(9) Install a new mother board in the reverse order of steps (1) to (7),after the work of step (8).

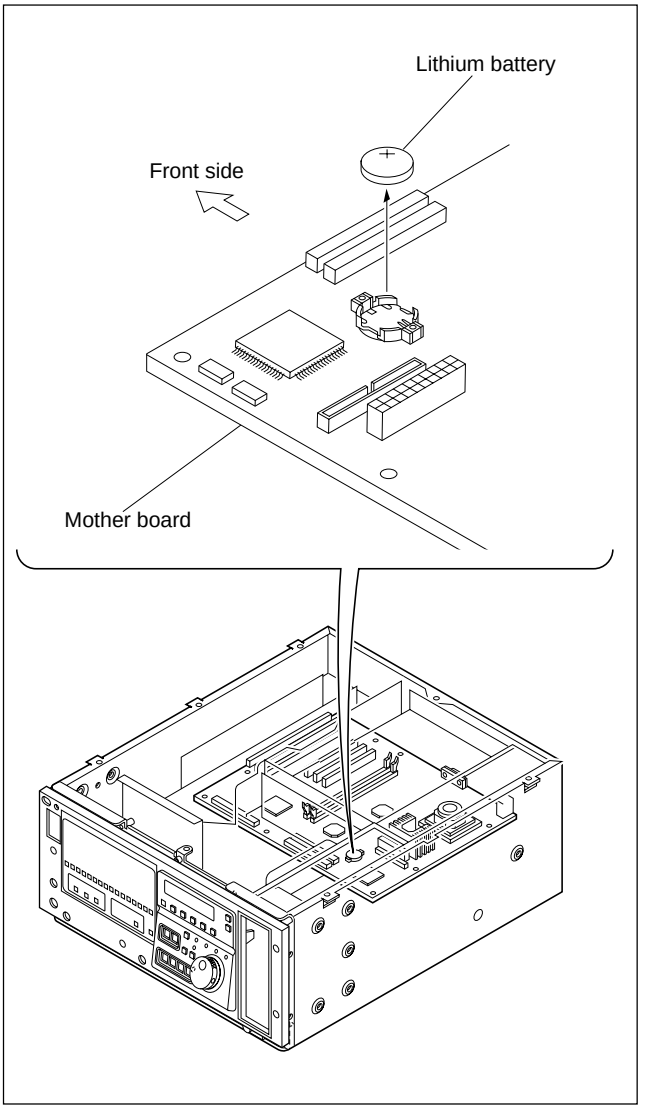
1-4-5. Replacement of Lithium Battery

A lithium battery for data back-up is installed on the mother board.
When replacing a lithium battery, be sure to use to the listed part on the parts list of Section 2. Spare Parts.

Note

Before performing, turn the power off in the unit.

(1) Remove the top cover. (Refer to Section 1-3. Removal of Cabinets)
(2) Remove the AES board, AD/DA converter board and SYNC board. (Refer to Section 1-4-1. Replacement of Power Supply)
(3) Remove the card cage bracket. (Refer to Section 1-4-1. Replacement of Power Supply)
(4) Remove the lithium battery on the mother board.
(5) Install a new lithium battery on the mother board.



1-4-6. Note of Token-ring board replacement

When the Token-ring board was replaced, perform setting the jumper wires (W1, W2) on the new Token-ring board with the factory setting. (Refer to 1-1-5. Jumper Settings and LED Functions.)

1-4-7. Note of SCSI board replacement

When the SCSI board was replaced, perform setting the ”SCSI BIOS” after the new SCSI board has been installed on the Mother board.

Section 2
Spare Parts

2-1. Notes on Repair Parts

1. Safety Related Components Warning

WARNING

Components marked ⚠ are critical to safe operation. Therefore, specified parts should be used in the case of replacement.

2. Standardization of Parts

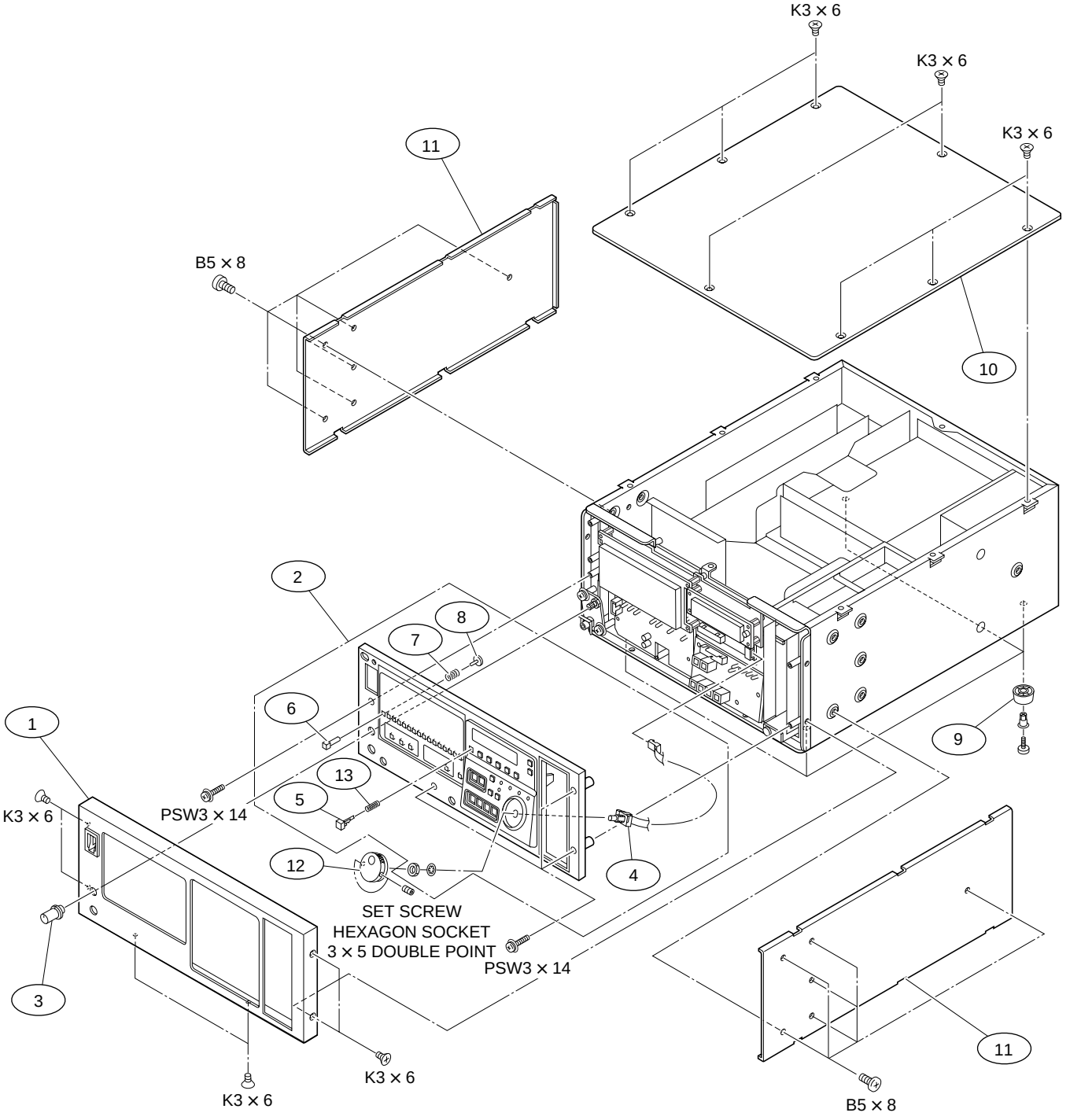
Some repair parts supplied by Sony differ from those used for the unit. These are because of parts commonality and improvement.
Parts list has the present standardized repair parts.

3. Stock of Parts

Parts marked with “o” at SP (Supply Code) column of the spare parts list may not be stocked. Therefore, the delivery date will be delayed.

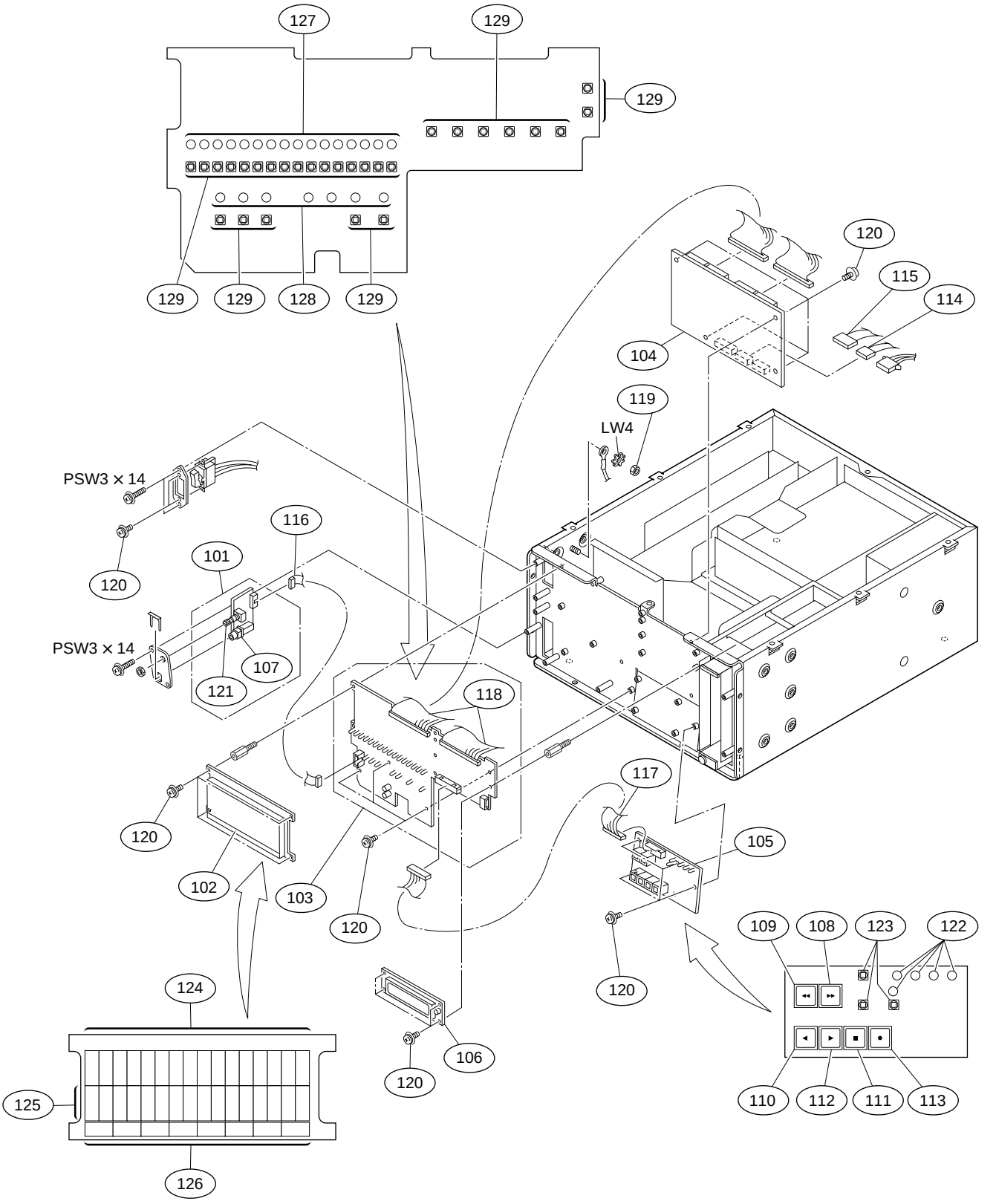
4. The individual component parts of all the boards that are using it with DADR-5000, DABK-F5001 and DABK-F5002 do not supply it as the service part except for the part that is entered to Parts List. Therefore, the service of the individual component part of each board becomes a board replacement.

2-2. Exploded Views and Parts List



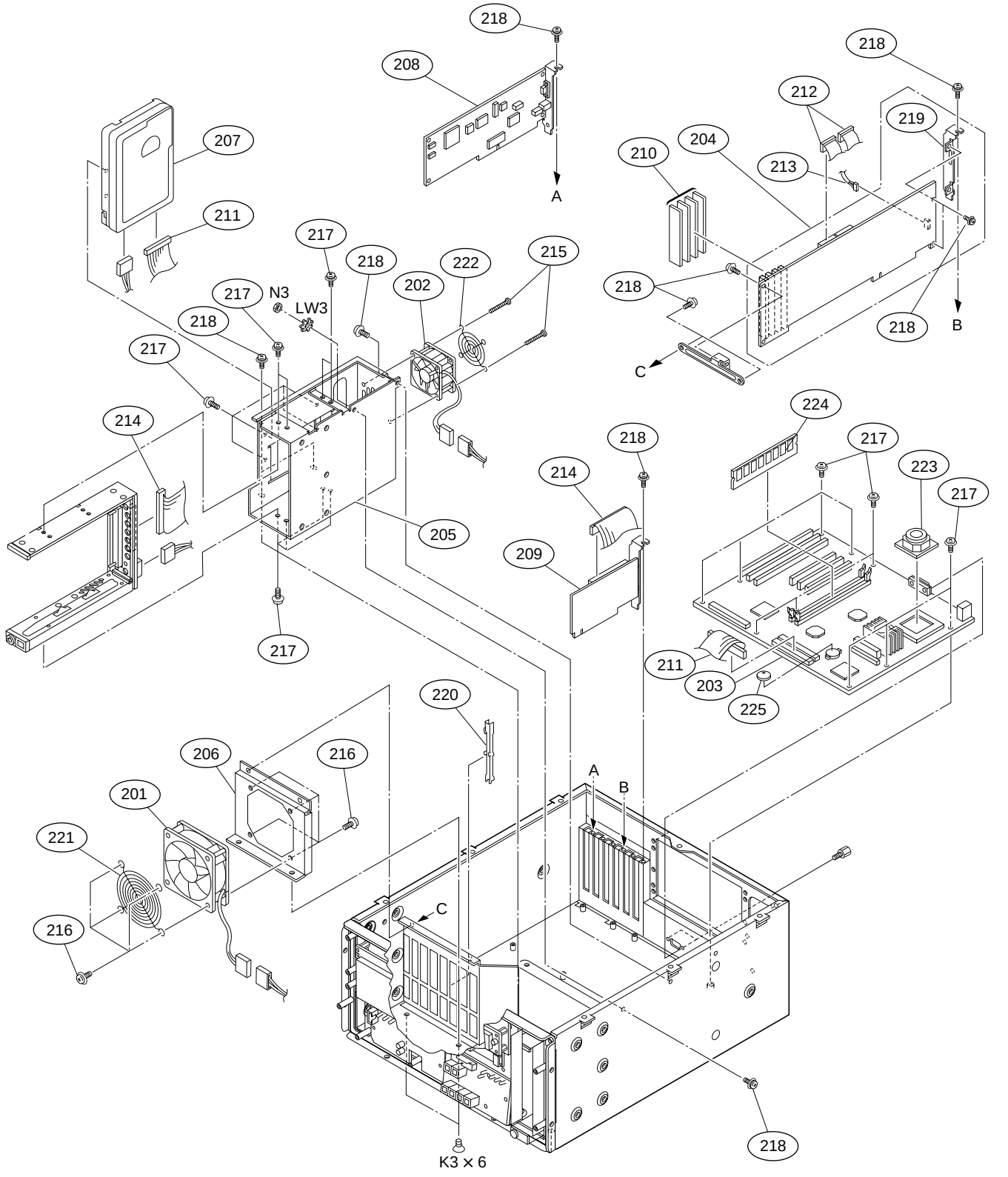
No.	Part No.	SP	Description
1	A-8031-127-A	o	FRONT PANEL COVER ASSY
2	A-8046-125-A	s	FRONT PANEL BEZEL ASSY (SRVC)
3	X-3167-823-1	s	KNOB ASSY (P), VOL
4	1-771-494-11	s	ROTARY ENCODER
5	3-166-929-01	o	KEY TOP (LARGE)
6	3-166-930-01	o	KEY TOP (SMALL)
7	3-567-099-01	o	SPRING, COMPRESSION
8	3-668-009-02	o	PIN, PUSH BUTTON
9	4-632-313-01	s	FOOT
10	4-637-575-01	o	COVER, TOP
11	4-637-576-01	o	PANEL, SIDE
12	4-637-592-01	o	KNOB, SHUTTLE
13	4-862-354-00	s	SPRING, COMPRESSION

Front Boards Block



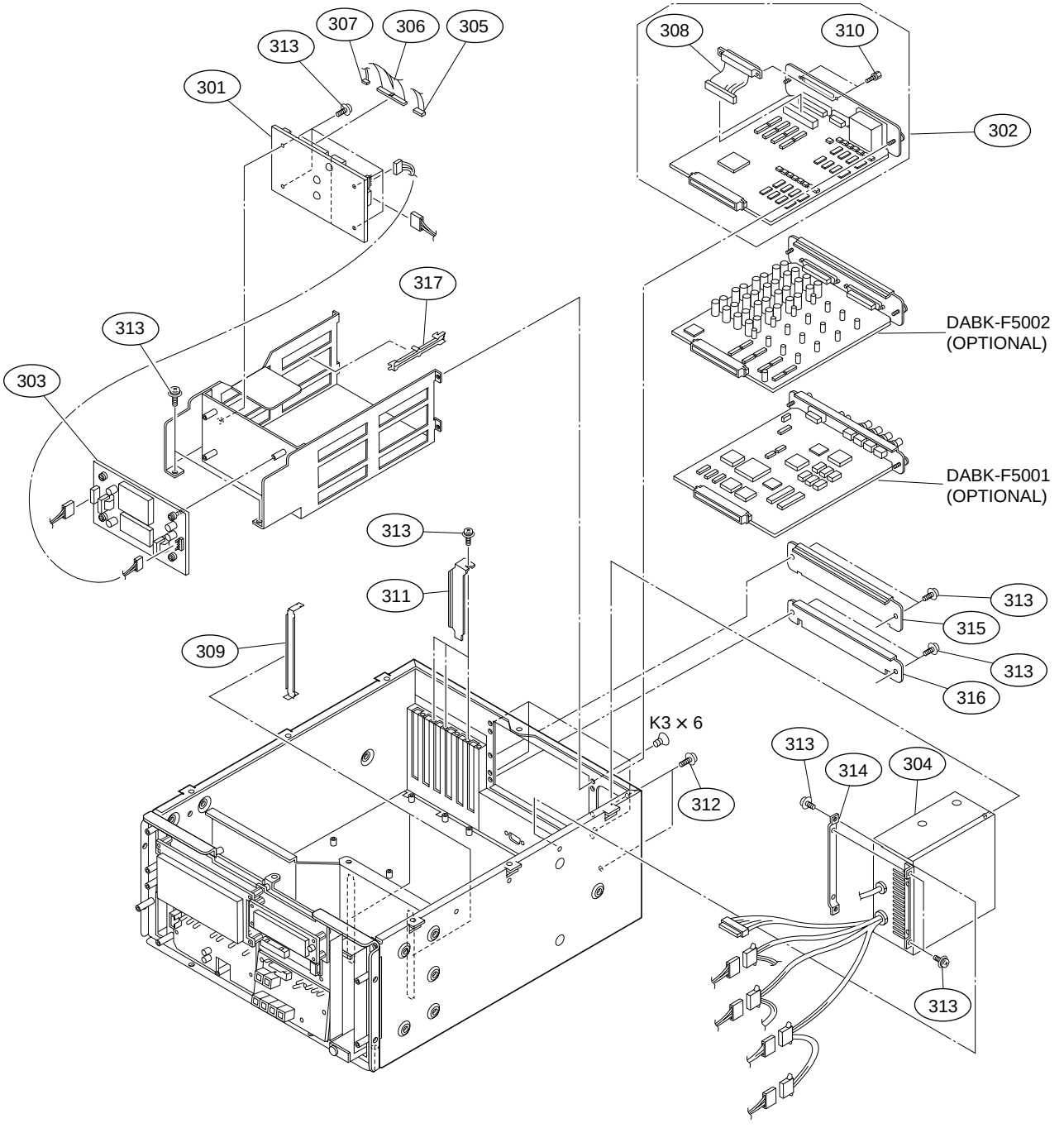
No.	Part No.	SP	Description
101	A-8045-550-A	s	HEADPHONE ASSY (SERVICE)
102	A-8045-551-A	s	METER PWBA (SERVICE)
103	A-8045-552-A	s	FRNT PNL, PWBA (SERVICE)
104	A-8045-553-A	s	FRNT PNL CNTRLR PWBA (SRVC)
105	A-8045-554-A	s	TRANSPORT PWBA (SERVICE)
106	A-8046-007-A	s	PWBA, VF DISPLAY (SERVICE)
107	1-507-796-71	s	JACK, STEREO 1/4"
108	1-572-607-11	s	PUSH BUTTON, LIGHTED, FF
109	1-572-607-21	s	PUSH BUTTON, LIGHTED, REW
110	1-572-607-41	s	PUSH BUTTON, LIGHTED, R PLAY
111	1-572-607-51	s	PUSH BUTTON, LIGHTED, STOP
112	1-572-607-61	s	PUSH BUTTON, LIGHTED, PLAY
113	1-572-608-11	s	PUSH BUTTON, LIGHTED, REC
114	1-958-775-11	s	CABLE ASSY, COM1
115	1-958-777-11	s	CABLE ASSY, BP/DSP/FPC
116	1-958-784-11	s	CABLE ASSY, HEADPHONE
117	1-958-785-11	s	CABLE ASSY, TRANSPORT
118	1-958-786-11	s	CABLE ASSY, FRONT PANEL
119	4-632-312-01	s	NUT (M4), KEPS
120	4-635-117-01	o	SCREW, M3x6 PPH
121	9-884-666-01	s	POT, 10K, STEREO AUDIO TAPER
122	9-884-667-01	s	LED, T1-3/4, GREEN
123	9-884-668-01	s	PUSH BUTTON, MOMENTARY
124	9-884-669-01	s	LED, 10POS BAR LED, 5R-5G
125	9-884-670-01	s	LED, 10POS BAR LED, 10G
126	9-884-671-01	s	LED, 4POS, 5x7DOT, YEL
127	9-884-672-01	s	LED, HLMP-4000, BI-COLOR
128	9-884-673-01	s	LED, HLMP-3502, GREEN
129	9-884-674-01	s	PUSH BUTTON, MOMENTARY

Inside Chassis Block (1)



No.	Part No.	SP	Description
201	A-8045-548-A	s	FAN ASSY (SERVICE)
202	A-8045-549-A	s	DRIVE FAN ASSY
203	A-8045-556-A	s	ANCHORAGE MBD (SERVICE)
204	A-8045-557-A	s	DSP FEAT CARD ASSY (SERVICE)
205	X-3168-167-1	o	HOUSING ASSY, DRIVE
206	X-4621-659-1	o	ASSY, FAN BRACKET
207	1-759-747-11	s	HDD, AC24300
208	1-761-072-11	s	PWBA, TOKEN RING, ISA BUS
209	1-761-073-11	s	PWBA, SCSI, PCI BUS
210	8-759-645-46	s	IC MT8D432M-60
211	1-958-774-12	s	CABLE ASSY, IDE
212	1-958-777-11	s	CABLE ASSY, BP/DSP/FPC
213	1-958-779-11	s	CABLE ASSY, AES REFERENCE
214	1-960-057-11	s	CABLE, SCSI (KINGSTONE)
215	4-628-450-01	s	SCREW (6-32UNCx1.25PPH)
216	4-633-375-01	s	SCREW
217	4-634-923-01	s	SCREW (6-32x.25)
218	4-635-117-01	o	SCREW, M3x6 PPH
219	4-638-075-01	o	BRACKET, DSP
220	4-638-079-01	o	GUIDE, CARD
221	4-638-129-01	o	GUARD, FAN, 120MM
222	4-638-130-01	o	GUARD, FAN, 60MM
223	8-759-545-87	s	IC PENTIUM 166
224	8-759-592-67	s	IC MT16LSDT464AG-662
225	1-528-174-31	s	BATTERY, LITHIUM (CR2032)

Inside Chassis Block (2)



No.	Part No.	SP	Description
301	A-8045-555-A	s	BACK PLANE PWBA (SERVICE)
302	A-8045-558-A	s	AES FEAT CARD ASSY (SERVICE)
303	A-8045-560-A	s	CONV. P/S PWBA (SERVICE)
304	⚠ 1-468-335-11	s	POWER SUPLLY
305	1-958-776-11	s	CABLE ASSY, COM2
306	1-958-777-11	s	CABLE ASSY, BP/DSP/FPC
307	1-958-779-11	s	CABLE ASSY, AES REFERENCE
308	1-958-787-11	s	CABLE ASSY, AES
309	4-628-494-01	o	CLAMP, RIBBON CABLE
310	4-633-218-01	s	SCREW (CN)
311	4-634-922-01	o	BRACKET, ISA (BLANK)
312	4-634-923-01	s	SCREW (6-32x.25)
313	4-635-117-01	o	SCREW, M3x6 PPH
314	4-637-581-01	o	BRACKET, POWER SUPPLY
315	4-637-597-01	o	CONVERTER BRACKET, BLANK
316	4-637-598-01	o	TIME CODE BRACKET, BLANK
317	4-638-079-01	o	GUIDE, CARD

2-3. Electrical Parts List for Boards

```
---------------
AES FEATURE CARD
---------------
Ref No.
or Q'ty  Prat No.     SP Description

U2       9-884-681-01  s IC, ROM, AESMPALPOF, V 1.2




------------------
FP CONTROLLER BOARD
------------------
Ref No.
or Q'ty  Prat No.     SP Description

U7       9-884-675-01  s IC, CPU, FRNTPNL. HEX, V 1.2
U9       9-884-678-01  s IC, EPLD, SERCNTR. POF, V 1.0
U22      9-884-680-01  s IC, EPLD, DECODER. POF, V 1.0
U28      9-884-677-01  s IC, EPLD, FRNT_PNL. POF, V 1.0
U33      9-884-676-01  s IC, FL-ROM, METERS. S1, V 1.5



----------------------
DABK-F5001 (SYNC BOARD)
----------------------
Ref No.
or Q'ty  Prat No.     SP Description

U3       9-884-684-01  s IC, EPLD, MEMDEC3. POF, V 1.0
U4       9-884-685-01  s IC, FL-ROM, TCM. S1, V 1.5
U18      9-884-682-01  s IC, EPLD, PLLCNTR. POF, V 1.3
U27      9-884-683-01  s IC, EPLD, AESCNTR. POF, V 1.6
```

2-4. Supplied Accessories

```
---------
DADR-5000
---------
Ref No.
or Q'ty  Prat No.     SP Description

   2     1-778-862-21  o CONNECTOR, D-SUB, 25P-F
   1     1-778-863-11  o CONNECTOR, D-SUB, 25P-M
   1     1-958-851-11  s CABLE ASYY, TOKEN RING
   1     1-958-882-11  o CONNECTOR, D-SUB, 37P-M
   1     1-958-883-11  o CONNECTOR, D-SUB, 9P-M

   1     4-638-182-01  s MANUAL, OPERATION



----------------------
DABK-F5001 (SYNC BOARD)
----------------------
Ref No.
or Q'ty  Prat No.     SP Description

   1     1-793-340-11  o CONNECTOR, PLUG
   1     1-958-883-11  o CONNECTOR, D-SUB, 9P-M



--------------------------------
DABK-F5002 (AD/DA CONVERTER BOARD)
--------------------------------
Ref No.
or Q'ty  Prat No.     SP Description

   1     1-793-341-11  o CONNECTOR, D-SUB, 50P-F
   1     1-793-342-11  o CONNECTOR, D-SUB, 50P-M
   2     3-202-677-01  o BACKSHELL, D-SUB, 50P
```

Section 3
Block Diagrams and Frame Wiring

3-1. Block Diagrams

DADR-5000 Functional Description

This section provides a brief description of the major functional of the DADR-5000.
The DADR-5000 block diagram shows the PWBs contained in the DADR system.
Some boards are standard off the shelf components and some are unique to the DADR.

Pentium PC Mother board

The PC Mother board is the main system processor. It runs the DADR specific applications which perform the following major functions:

1. Control of recording and playback of audio from the HDD including creation and maintenance of event lists and project files.
2. Communication with networked DADRs via the token-ring interface.
3. Graphical user interface that allows user control of multiple network boxes and event editing via mouse, keyboard and VGA monitor.
4. Rate control for chasing/syncing to various timecodes including LTC, VITC, biphase and P2.

Interface to the HDD drives (or other media) is performed through the Advansys SCSI adapters via the PCI bus. This allows audio data to be transferred directly between the Quad SHARC board and SCSI bus without passing through PC motherboard memory.

The following sections describe the operation of the boards unique to the DADR.
Detailed descriptions of the standard off the shelf components are available in the manufacture's data sheets.

Audio Signal Flow

Digital audio (16 channels) comes into the 8 AES inputs on the AES board where it is converted to a TDM stream; analog audio (16 channels) comes into the analog converter board where it is converted to a TDM stream and passed to the AES board. The TDM stream travels over 2 signals, each carrying 8 channels of audio.
Each audio sample on the TDM stream can be a maximum of 32 bits although only 24 bits are used or generated by the AES board. A clock signal at 256*Fs and a frame sync pulse is carried along with the TDM audio data.

Based on the user's audio input selection, the appropriate TDM stream is passed to the Quad SHARC board.
There it is processed and stored in DRAM to be transferred to the SCSI boards for recording to HDD.
It can also be passed back out as a TDM stream if input monitor is enabled. Playback audio data is transferred via SCSI from the HDD to the Quad SHARC board DRAM for processing and output as TDM stream.

The TDM digital audio output stream from the Quad SHARC board goes to three places in the DADR as follows:

1. AES board for output to the AES digital outputs.
2. Analog converter board for digital to analog conversion (16 channels).
3. Front panel controller for meter display.

The Backplane Interconnect Diagram shows the audio signal flow described above as well as the serial control signals that go from the Quad SHARC board to the AES board. If no SYNC board is present in the DADR, the AES reference comes into the AES board and passes directly to the Quad SHARC board and the AES reference outputs (the DADR is a slave in this case).
If a SYNC board is present, the AES reference input goes to the SYNC board where it is regenerated and sent back to the AES board. From the AES board it goes to the Quad SHARC board and reference outputs.
Note that if the DADR is slave without a SYNC board, the AES reference must originate from another DADR that generates an AES reference with time of day (TOD) information.
If the AES reference is used simply as a source of audio clock, a SYNC board must be present to regenerate the AES reference with time of day (TOD) information.

Front Panel and Front Panel Controller Board

The front panel controller has two processors:
the 89C52 8-bit microcontroller and the ADSP2115 16-bit fixed-point digital signal processor (DSP).

The 89C52 controls all the front panel buttons, individual LEDs, and the 2 line × 20 character VF display;
it is connected to LED driver logic, switch scan logic, encoder wheel logic and an interface to the DSP processor.
The microcontroller gets commands from the PC mother board via the COM1 serial communication port
115 kbits/sec and notifies the PC motherboard of button presses.
The 89C52 is programmed via a built-in PROM which is not field re-programmable.

The ADSP2115 DSP operates at 25 MHz and is programmed via 32 k × 8 PROM that is not field re-programmable.
The DSP converts the audio TDM stream to a 16-channel meter indication.
Each channel has an average level displayed as well as a peak level indication.
Peak levels are updated every 0.1 seconds and are held for 1.5 seconds. A fast attack slow decay algorithm is used to derive the average audio level.
The DSP sets the column address and row data registers in the meter interface logic that determines the LED pattern to be displayed.
The 16 × 16 array of LEDs are scanned left to right by the DSP at a fast rate (about 100 times/second) to avoid flicker.
The DSP also adds all 16 audio channels together to form a mono mix to be sent to the headphone digital to analog converter. Based on commands from the 89C52, the relative gain levels of each channel are changed to respond to the solo buttons on the front panel.
When one channel is selected, the gain is maximized for the selected channel. When more than one channel is selected, the gain is reduced to avoid clipping
the headphone output.

Quad SHARC Processor Board

The Quad SHARC processor board contains four ADSP21061 (SHARC) 32 bit floating point processors used for audio processing of 16 channels of audio.
All four SHARCs operate at a 40 MHz clock rate.
Since the SHARC code is downloaded to internal memory from the PC mother board, it can be field upgraded via the DADR software upgrade utility.

Audio data is input and output using the TDM formal of the serial ports of the ADSP21061.
There are two TDM audio signal streams with 8 channels per signal (2 serial ports are used).
The audio data is stored in the dual port DRAM where the SCSI board(s) or Pentium PC and the SHARC processors can access it simultaneously.
The SHARCs continuously store all incoming data in DRAM, and continuously read two subchannels per channel for event crossfades. This enables the seamless punching required for dubbing. Incoming data is gain adjusted and packed into 32 bit words prior to storage in DRAM(16,20, and 24 bits data is supported). The incoming data is also analyzed for capture of waveform data, which is also stored in DRAM.
Playback data is unpacked, crossfaded (the two subchannels are mixed into one), and rate filtered.
The input and playback data are crossfaded for glitch elimination during recording and an output gain is applied.
The data is then output to the TDM streams.
The SHARC processors also handle the GPI/GPO processing, DRAM buffer management and Pentium PC command processing.

The AES reference is also provided on the board to allow the DSP code to acquire the time of day (TOD) information carried with the DADR AES reference.
This allows the audio to be started and stopped on an exact audio sample relative to other DADRs.
The AES reference interface is also used to derive a master audio clock at 256*Fs (12.288 MHz at Fs = 48 kHz) to run the serial ports on the SHARCs. Through the AES board control interface, the SHARCs can reset the AES board, read/write the punch in/out lines (GPI), set the tally back data (GPO), select the audio input data (analog or digital), and set the AES configuration bits (C bits) in the AES output.

AES Board

The AES board provides AES digital audio input and output for 16 channels.
All AES audio streams must be synchronized with the AES reference in the DADR.
The 8 AES inputs and outputs are transformer-coupled to the AES receivers and transmitters.
The audio control logic converts the audio data going to and from the AES receivers and transmitters to the TDM serial streams required by the Quad SHARC processor.
Analog ADC audio (16 channels on two TDM lines) comes into the AES board where it is selected when the user requests analog inputs instead of the digital AES inputs.

The AES reference input and outputs are also transformer-coupled to the line receivers and line drivers for the reference. If no SYNC board is present in the DADR, the AES reference comes into the AES board and passes directly to the Quad SHARC board and the AES reference outputs (the DADR is a slave in this case). If a SYNC board is present, the AES reference input goes to the SYNC board and where it is regenerated and sent back to the AES board. From the AES board it goes to the Quad SHARC board and the reference outputs. In this way, all external devices get the same AES reference as the Quad SHARC in the DADR.
This avoids phase shifts caused by delays in the reference.
The AES reference outputs from the DADR can be used to drive other DADR AES reference inputs or to drive the AES reference input of external A/D converters.

The AES board also provides 16 channels of punch-in inputs (16 GPI lines), punch-out inputs (16 GPI lines), and tally back outputs (16 GPO lines). The punch in and out logic is opto-isolated and is activated by a pull to ground.
Each GPI input has a 1K resistor in series with an opto-isolator LED connected to approximately 12 volts.
The punch in/out latch logic provides a debounce function and latches the inputs on each audio sample.
The GPI latch state can also be set from the Quad SHARC via the AES control interface.
The 16 tallies are also controlled by the Quad SHARC board and are programmed to indicate when a channel is punched in (recording) with a high level output (approximately 5 volts).

Converter Board (DABK-F5002) and Converter Power Supply

Analog audio (16 channels) comes into the analog converter board and is converted to a TDM stream. This TDM stream goes to the AES board where is can be selected when the user requests analog inputs.
The audio input signal level will cause clipping at 24 dBm.
This level is trimmed during board calibration to be within +/− 0.1 dB. The analog-to-digital converters used are AK5392, which have a dynamic range of about 110 dB.
All of the audio line receive circuits are balanced and provide an overall dynamic range typically greater than 108 dB.
Thespecification of the analog to digital conversion on the board is a dynamic range greater than 105 dB (20 - 20 kHz).
The 8 stereo 12S outputs of the AK5392s are converted to a digital TDM stream and output to the AES board.

Digital TDM audio comes into the analog converter board via a differential line receiver and is converted to 8 stereo 12S signals to drive the 8 Crystal CS4390 stereo digital-to-analog converters. The CS4390 has a dynamic range of about 100 dB, which is maintained throughout the balanced line driver circuits.
The output clip level of the analog audio output is +24 dBm.
This level is trimmed during board calibration to be within +/− 0.1 dB.

The converter board requires a low noise converter power supply to supply +15 V, −15 V and +5 volts, all with isolated grounds. The common ground point in the converter board is the right bracket connection. This means that if the converter board is not screwed in to the DADR,it may not function properly.
The converter power supply is constructed using high frequency DC-DC converters and common mode rejection chokes.
This reduces the noise level caused by the switching power supplies in the DADR.

SYNC Board (DABK-F5001)

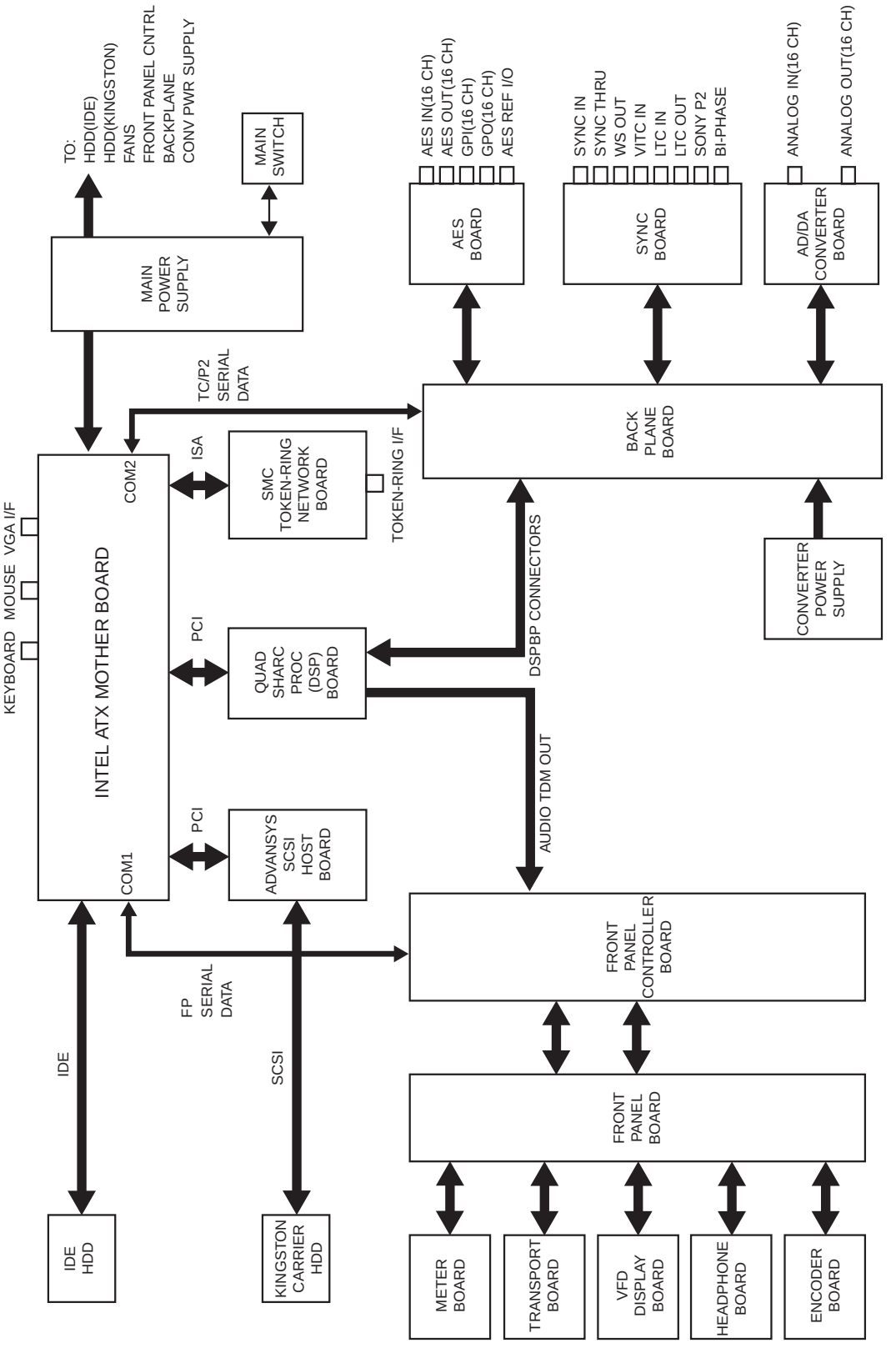
The SYNC board has an ADSP2115 digital signal processor (DSP) that operates at 25 MHz and is programmed via a 32 k × 8 PROM that is not field re-programmable.
The board provides three functions as follows:

1. Creates an AES audio reference with TOD information for use with the DADR.
   The audio reference frequency and phase is determined by a phase-frequency lock loop which can lock the AES audio sample rate to a word clock input; external AES input; an NTSC color sync signal (29.97 Hz frame rate); an NTSC black-and-white black burst sync signal (30 Hz frame rate); or a PAL sync signal (25 Hz frame rate). The board also generates a word clock output at the sample rate of the DADR.
2. Reads timecode from either an LTC input or VITC input and re-generates an LTC output. Reads biphase input for synchronization to film frames.
3. Transmits and receives SONY P2 serial protocol from the RS-422 (Dsub, 9pin) connector and passes it to the PC mother board via the COM2 serial communication port.

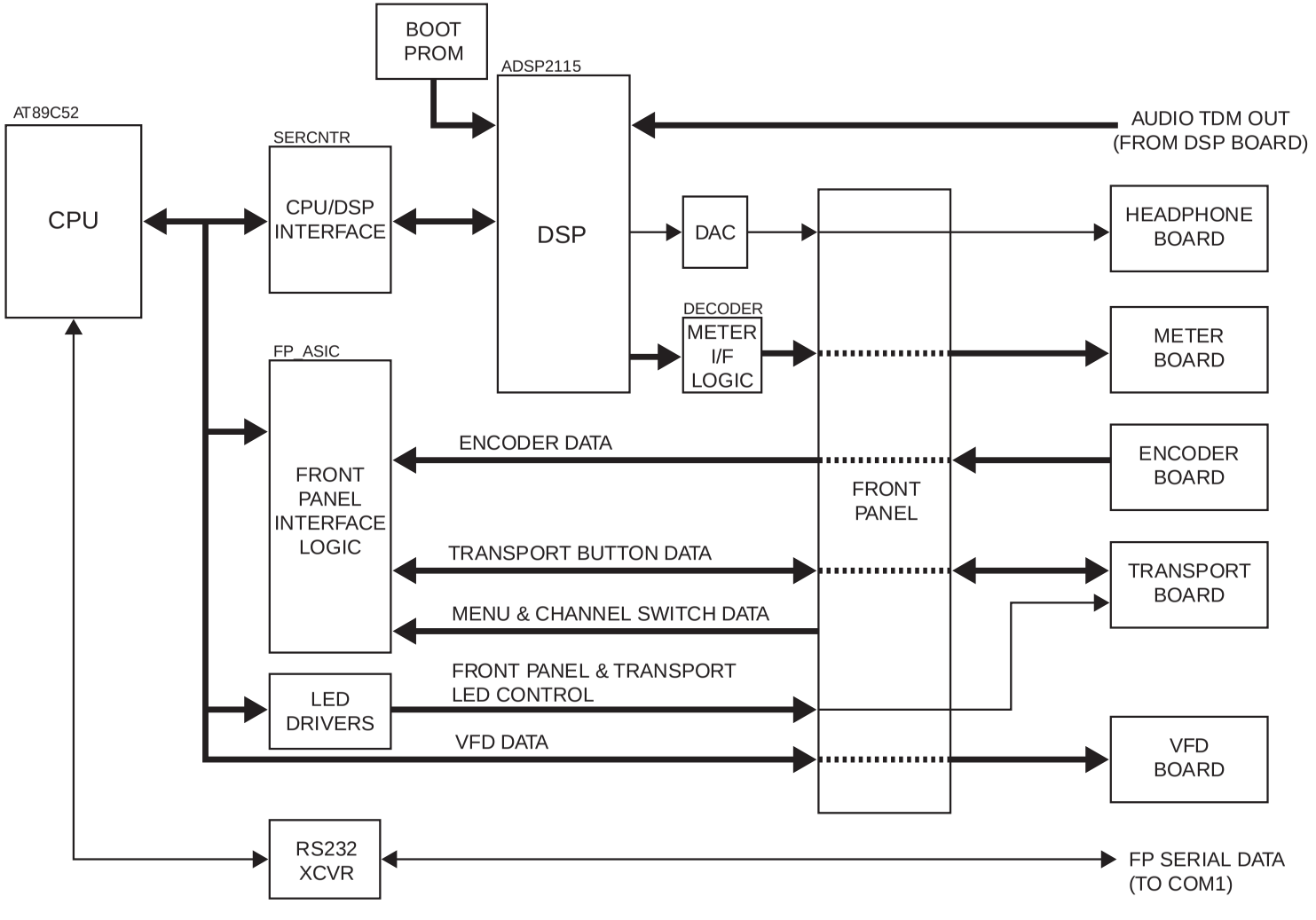
The sync portion of the board uses a phase-frequency detector to lock one of 6 VCXOs to the selected sync source. The frequencies of the VCXOs are 256 times the sample rate. Six sample rates are supported; 44056, 44100, 44144, 47952, 48000, and 48048 Hz. The +/− 0.1 % frequencies (44056, 44144, 47952, 48048) are only supported for NTSC color sync input, word clock, or external AES. The VCXO is selected by the DSP based on user input. A programmable divider ratio is also set by the ADSP2115. If the user selects no sync source (Internal clock), the phase frequency detector is disabled and VCXO will run at its nominal frequency.
The 256*Fs signal generated by the VCXO is used to create all the other sample locked frequencies on the SYNC board (128*Fs and Fs).

The timecode portion of the board uses an ICS2008 timecode CODEC to receive LTC and VITC and generate LTC. The DSP manages all the real-time timecode processing functions. Communication with the PC mother board COM2 port is provided through a RS-232 port UART interfaced to the DSP. As each timecode frame arrives at the timecode CODEC, the DSP time stamps the frame edge with the sample count which is based on the AES time of day count.
The sample count derived by the Quad SHARC processor board is the same sample count used by the ADSP2115.
This serial timecode data and the time stamp are sent to the Pentium PC processor for further processing. P2 serial data is also processed at the same time as timecode data and sent to the Pentium PC.
The LTC output is generated based on the input timecode data; when no timecode data is being read, LTC output can be generated at a specified rate locked to the video sync input or a derived frame edge clock. Biphase signals are fed to the IRQ of the ADSP2115 and are time stamped in a similar fashion to the frame edges of the timecode data.

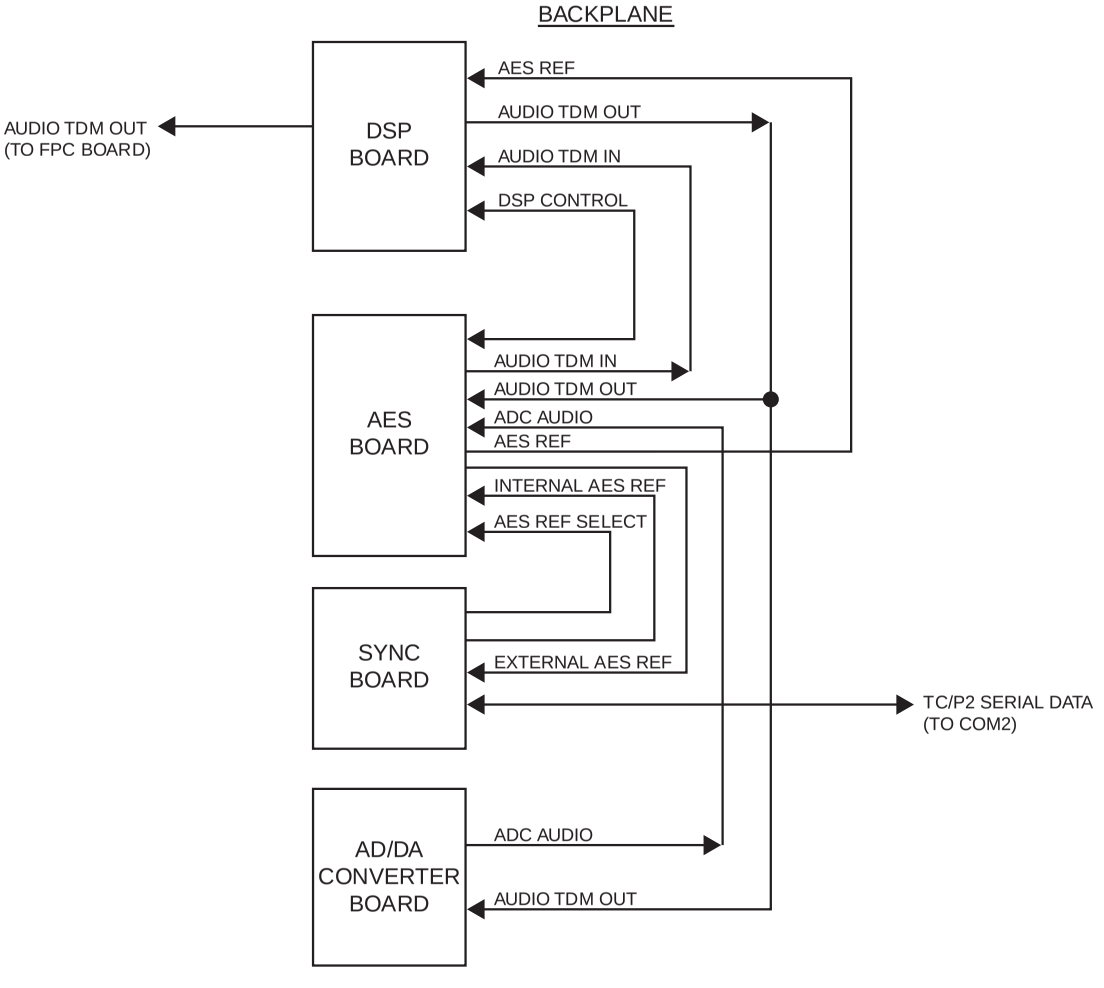
Overall Block Diagram



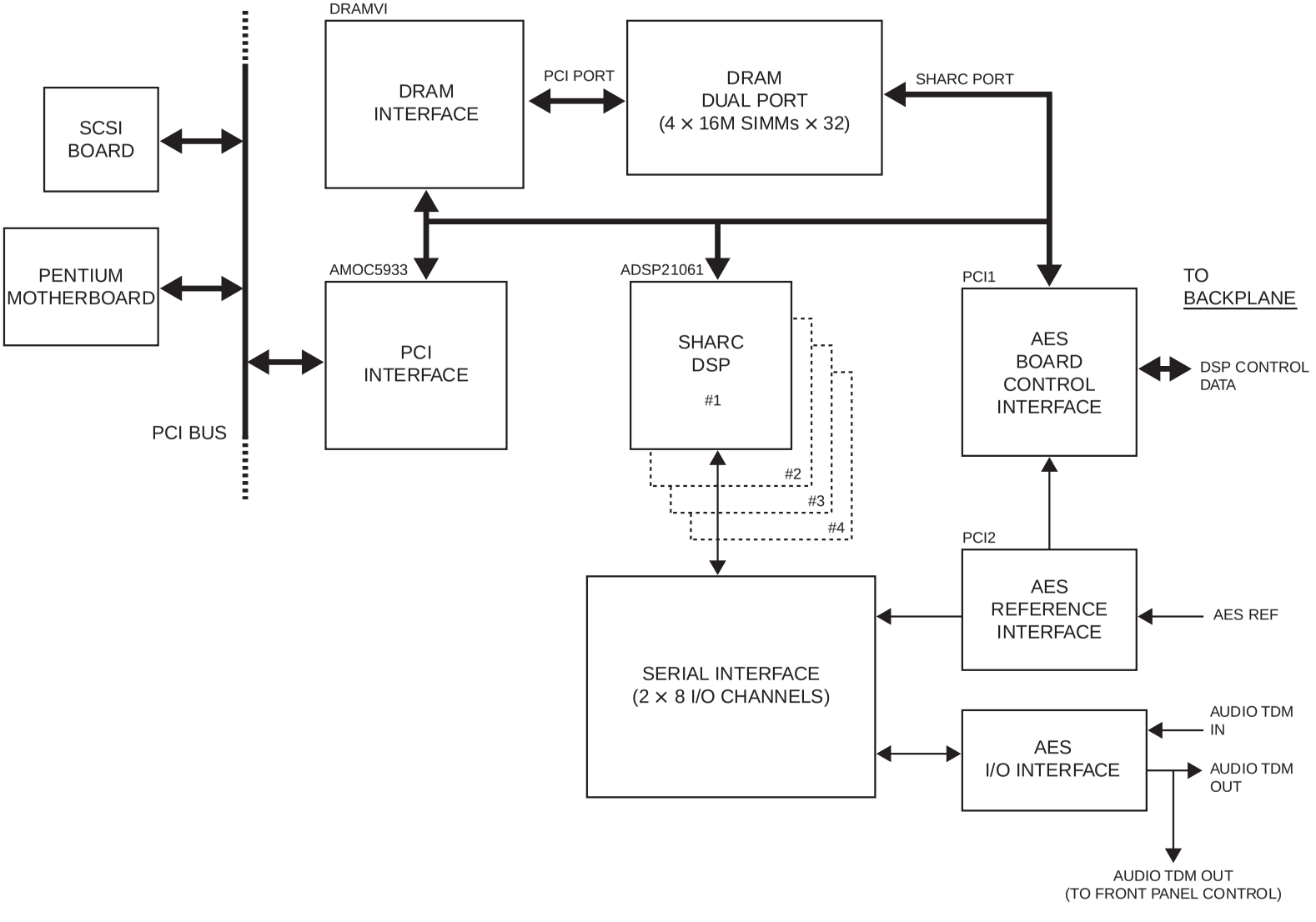
Front Panel Controller Board Block Diagram



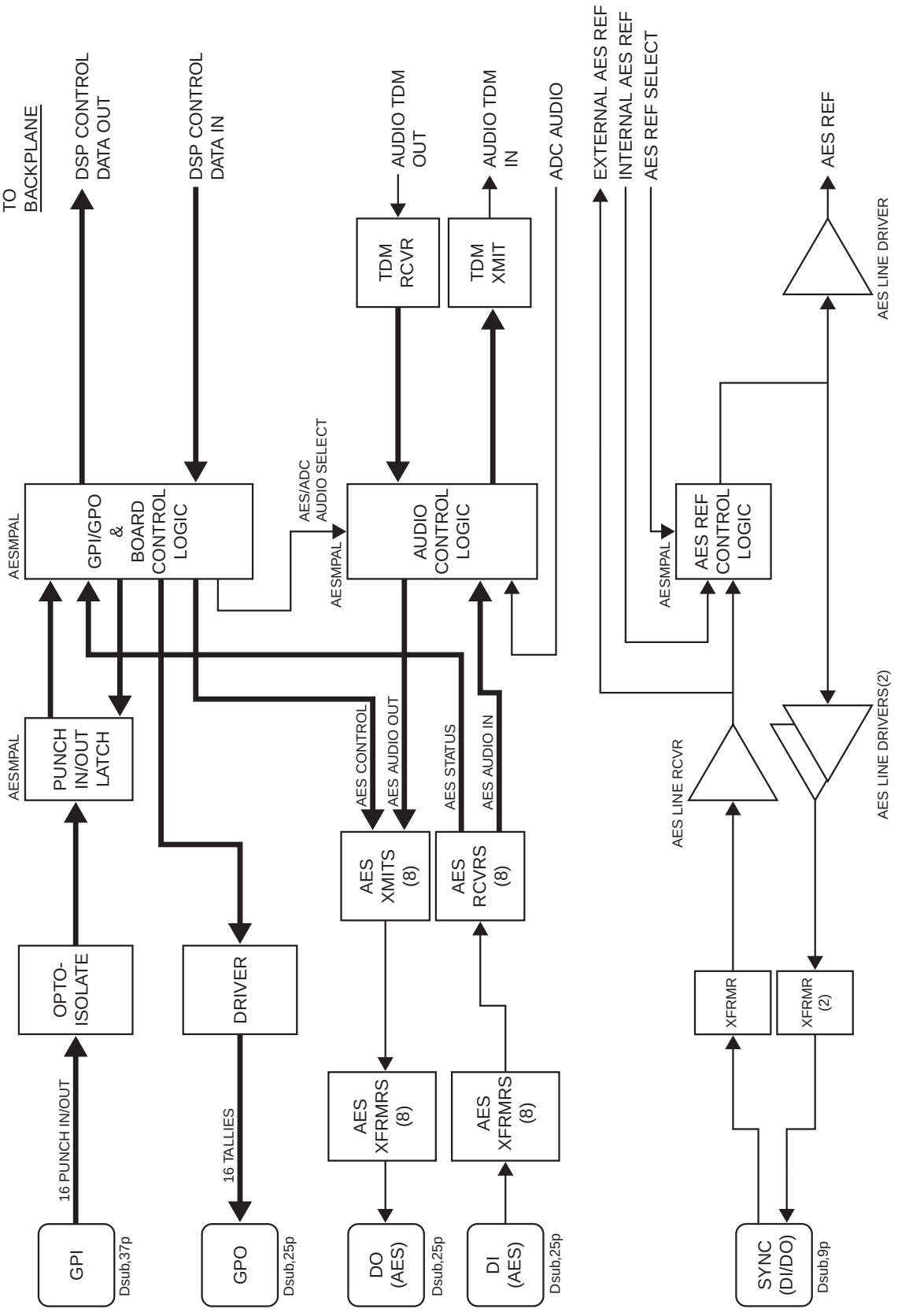
Backplane Interconnect Diagram



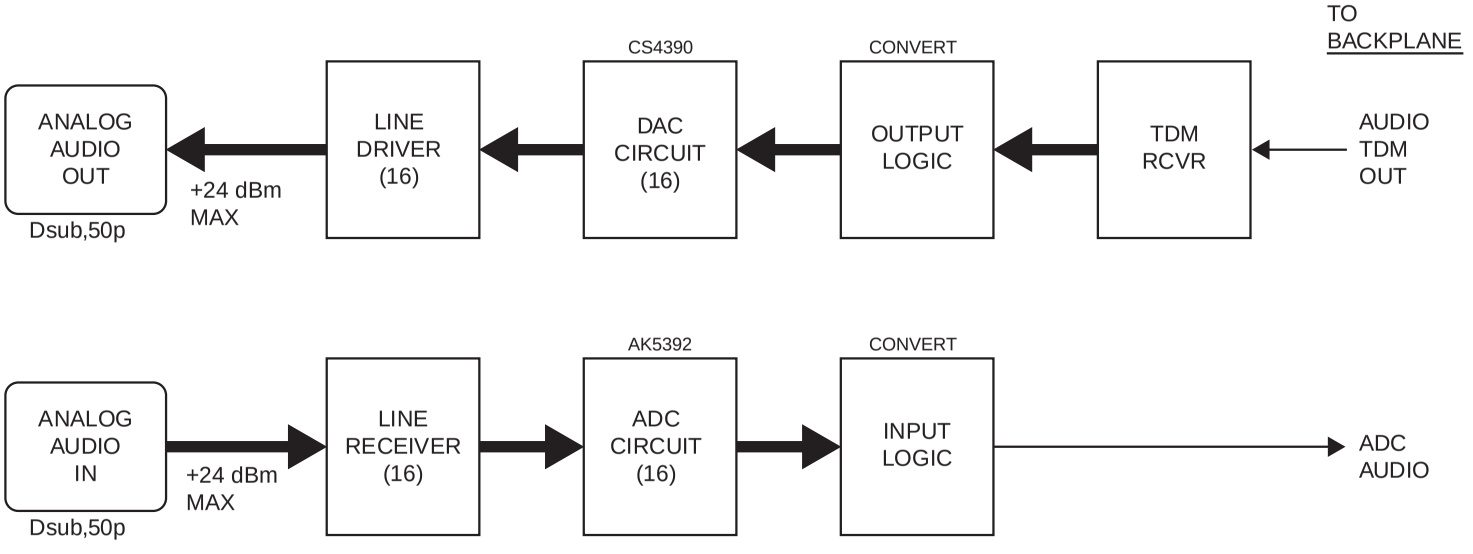
Quad SHARC Processor (DSP) Board Block Diagram



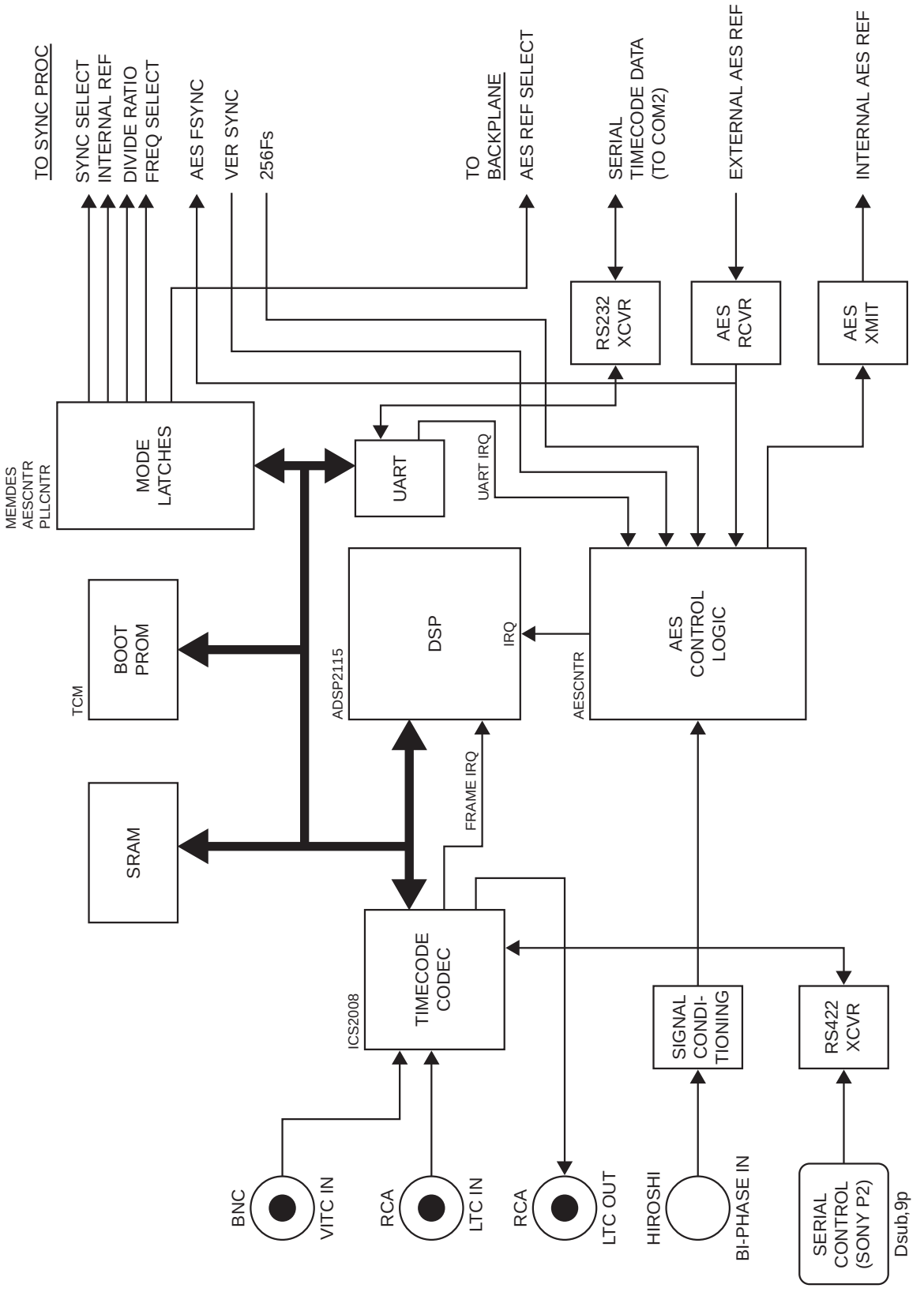
AES Board Block Diagram



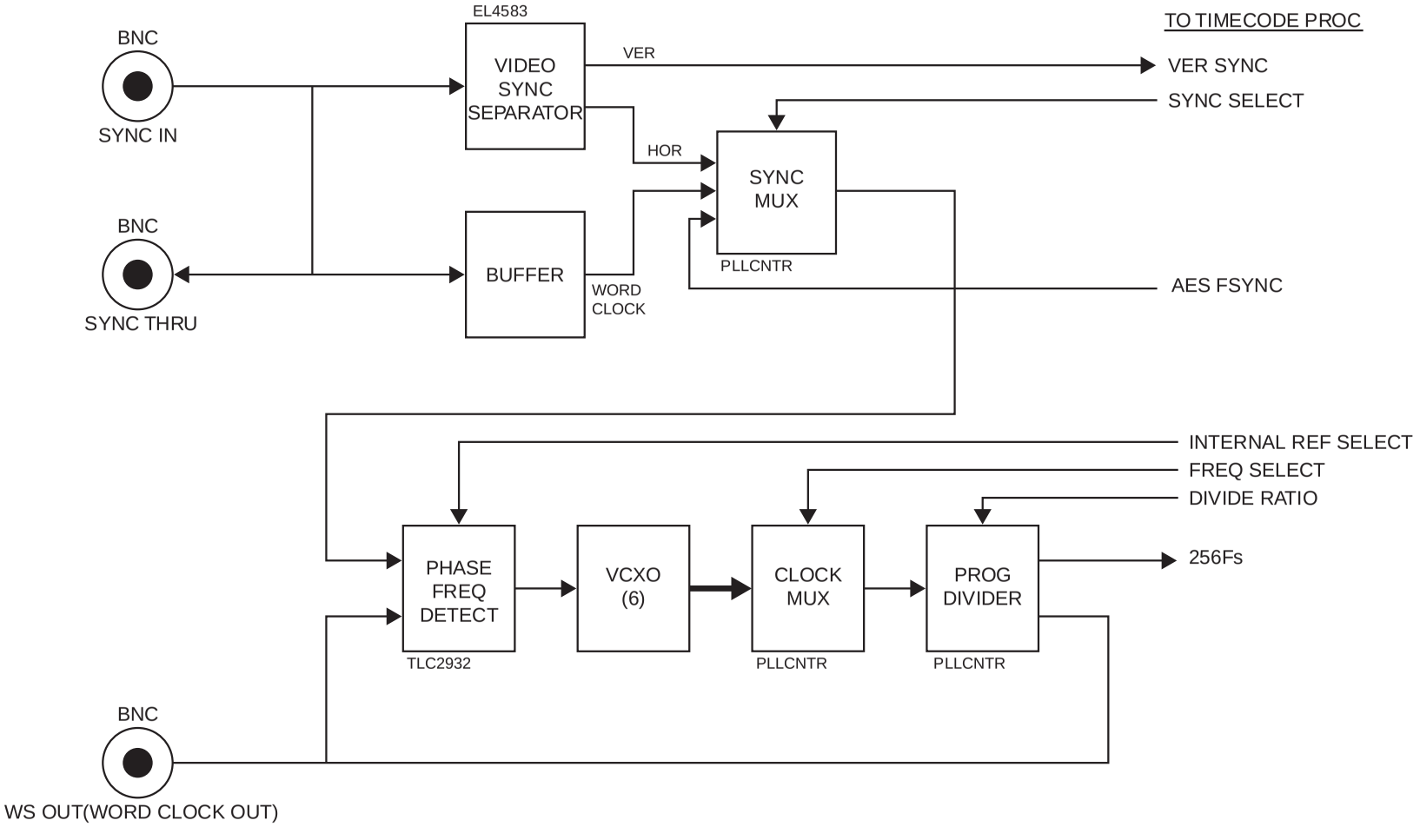
AD/DA Converter Board (DABK-F5002) Block Diagram



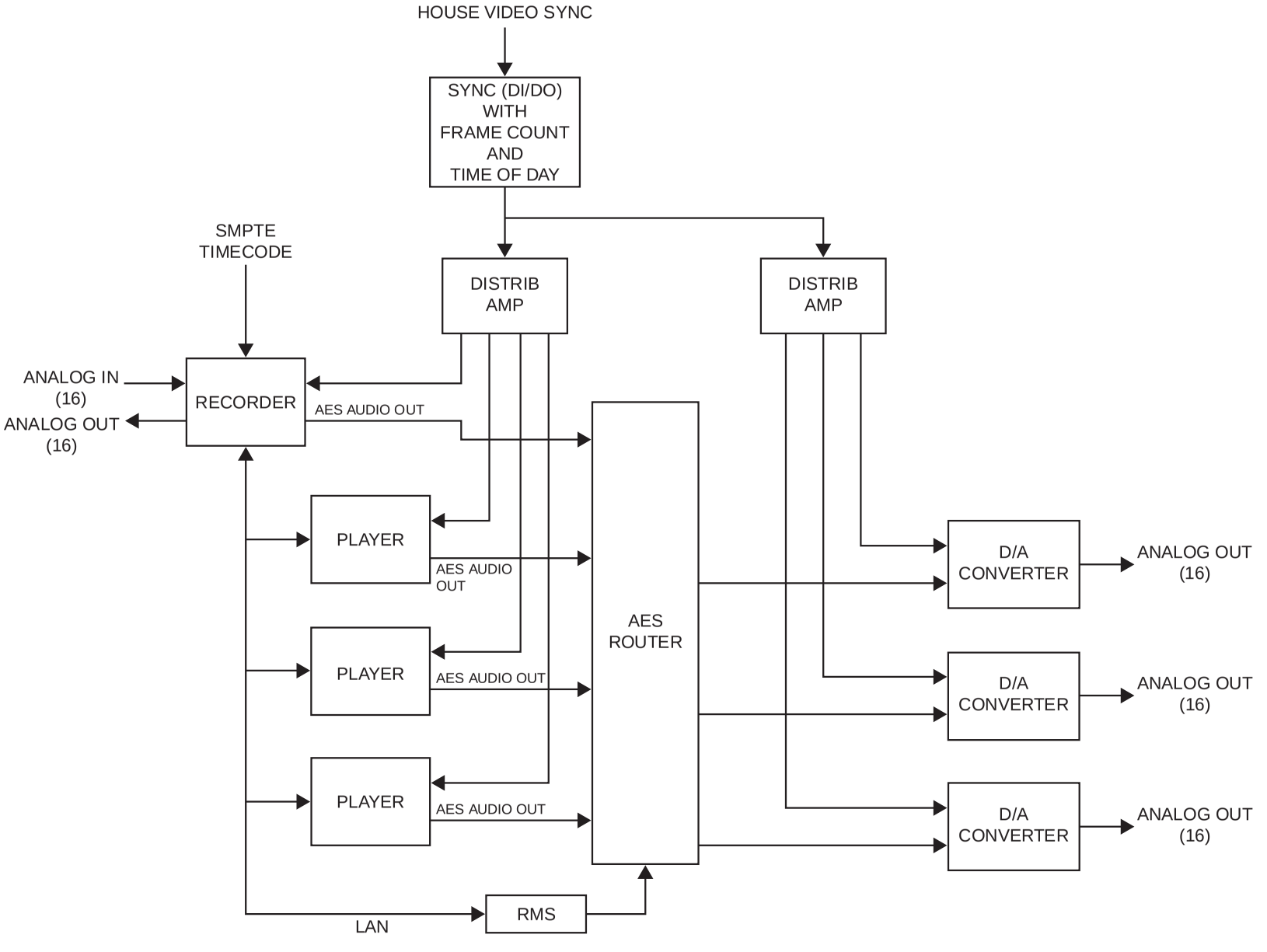
SYNC Board (DABK-F5001) Block Diagram (Timecode Processing)



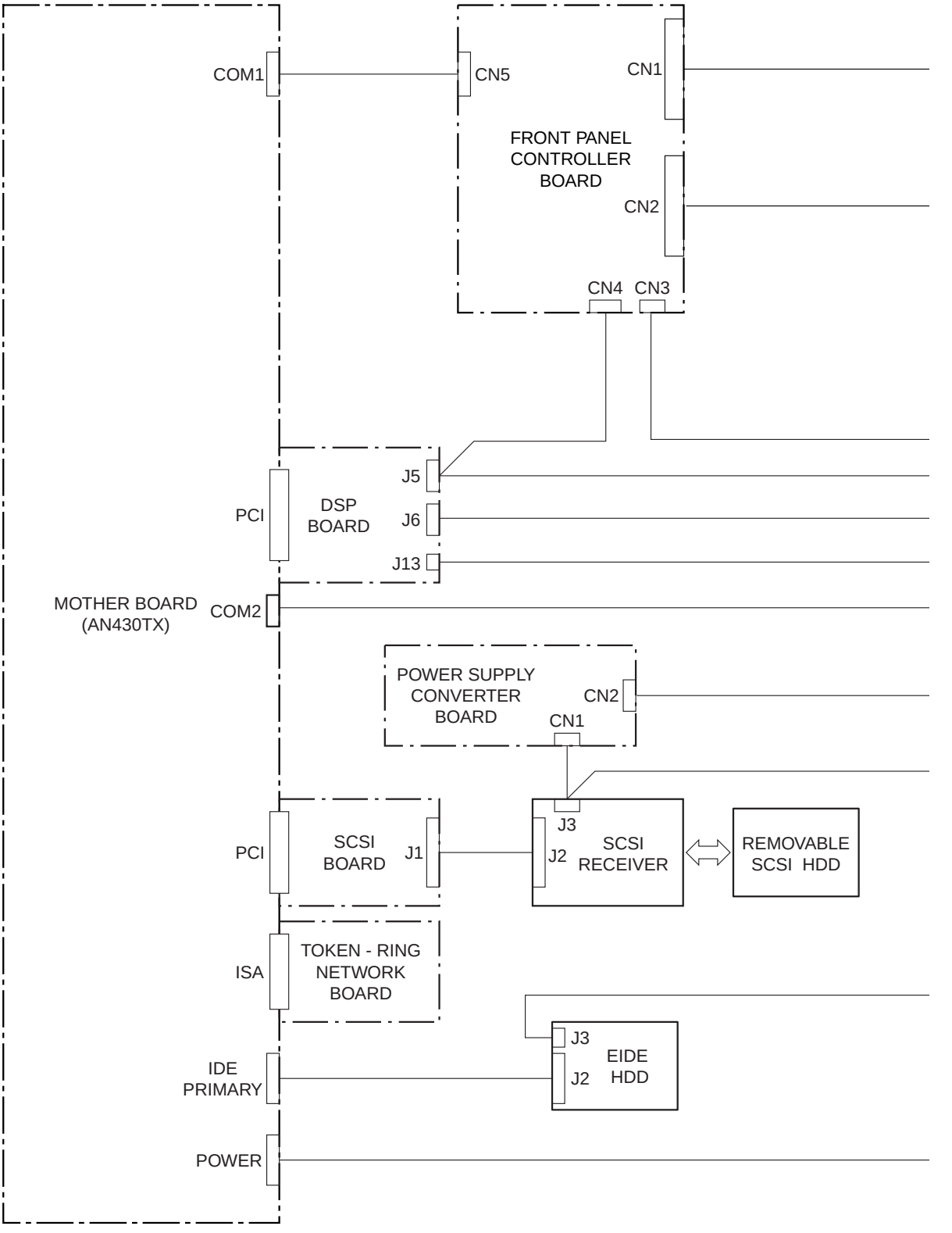
SYNC Board (DABK-F5001) Block Diagram (SYNC Processing)

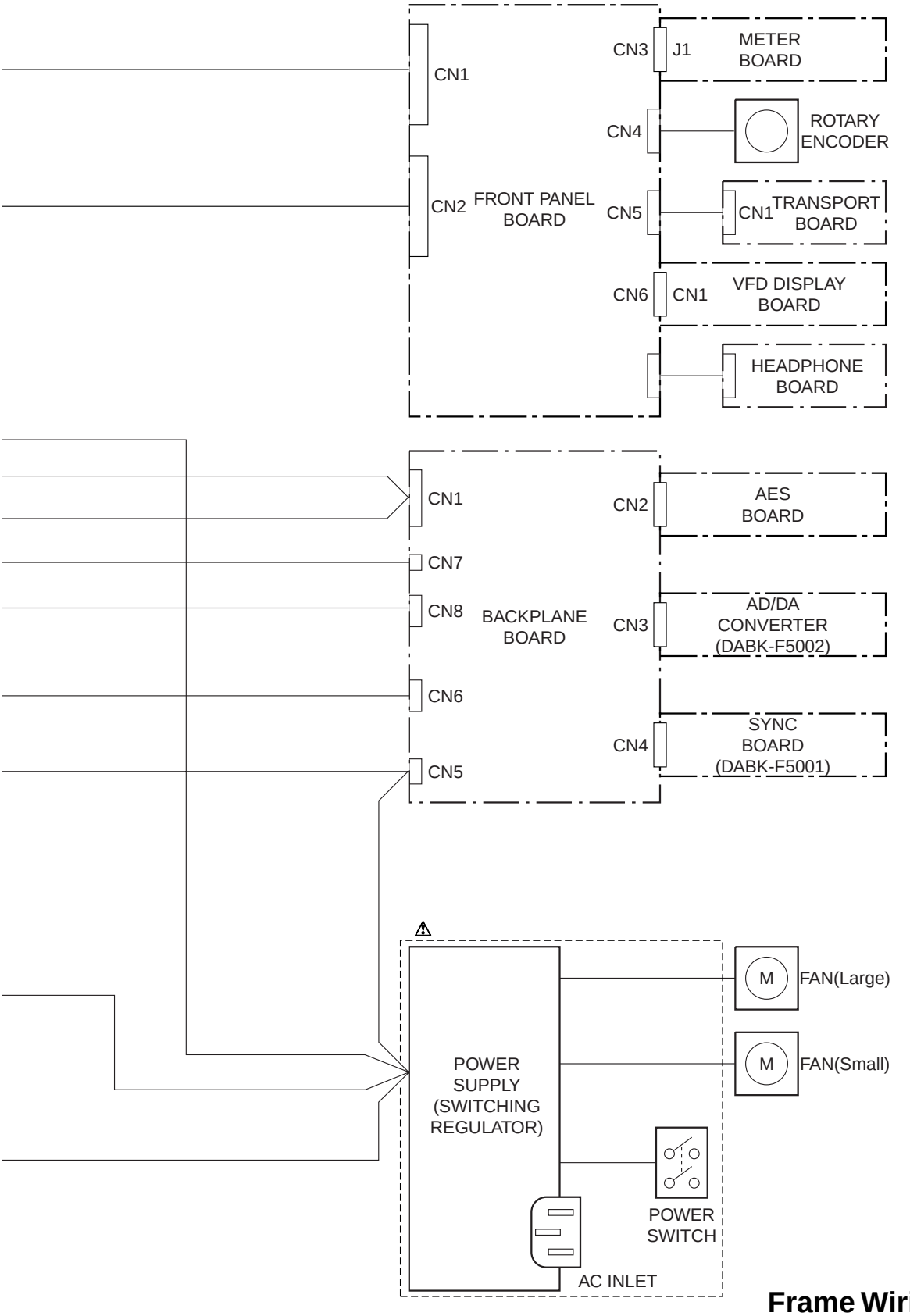


Recommended AES REF Studio synchronization



3-2. Frame Wiring





Frame Wiring

DADR-5000/DABK-F5001/DABK-F5002

このマニュアルに記載されている事柄の著作権は当社にあります。
従って，当社の許可なしに無断で複写したり，説明内容(操作，保守等)と異なる目的で本マニュアルを使用することを禁止します。

The material contained in this manual consists of information that is the property of Sony Corporation.
Sony Corporation expressly prohibits the duplication of any portion of this manual or the use thereof for any purpose other than the operation or maintenance of the equipment described in this manual without the express written permission of Sony Corporation.

Le matériel contenu dans ce manuel consiste en informations qui sont la propriété de Sony Corporation.
Sony Corporation interdit formellement la copie de quelque partie que ce soit de ce manuel ou son emploi pour tout autre but que des opérations ou entretiens de l'équipement à moins d'une permission écrite de Sony Corporation.

Das in dieser Anleitung enthaltene Material besteht aus Informationen, die Eigentum der Sony Corporation sind.
Die Sony Corporation untersagt ausdrücklich die Vervielfältigung jeglicher Teile dieser Anleitung oder den Gebrauch derselben für irgendeinen anderen Zweck als die Bedienung oder Wartung der in dieser Anleitung beschriebenen Ausrüstung ohne ausdrückliche schriftliche Erlaubnis der Sony Corporation.

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer :

Check the metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 3.5 mA. Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 5.25 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 20 V AC range are suitable. (See Fig. A)

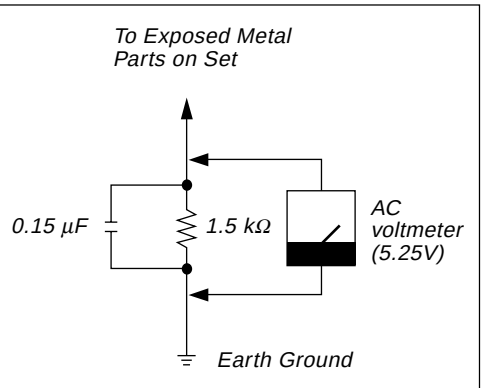


Fig A. Using an AC voltmeter to check AC leakage.

DADR-5000 (SY)
DABK-F5001 (SY)
DABK-F5002 (SY) E
9-976-883-01

Sony Corporation
B&P Company

Printed in Japan
1999. 11 26
©1999